

CONSTRUCTION PERMIT GRANT - NSPS

ERMITTEE

Calumet Energy Team, LLC
Attention: Robert Muehlenkamp
3 First National Plaza,
70 West Madison Street
Chicago, Illinois 60602-4206

Application No: 99110107

I.D. No.: 031600GHA

Applicants Designation:

Date Received: November 24, 1999

Subject: Gas Turbines (Power Production)

Date Issued: May 18, 2000

Location: 116th St. and Torrence Ave., Chicago, 60617

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of 305 MW_e power plant with two combustion turbines (gas or fuel oil fired) and one fuel oil storage tank as described in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. The turbines are subject to the New Source Performance Standard (NSPS) for Stationary Gas Turbines, 40 CFR 60, Subpart A and GG. The Illinois EPA is administrating NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
 - b. The Permittee shall not emit into the atmosphere from any turbine any gases which contain nitrogen oxides (NO_x) in excess of the applicable standards pursuant to 40 CFR 60.332 (a)(1), except as allowed by 40 CFR 60.332(f).
 - c. The Permittee shall not emit into the atmosphere from any turbine any gases which contain sulfur dioxide (SO₂) in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis, or shall not burn any fuel which contains sulfur in excess of 0.8 percent by weight, pursuant to 40 CFR 60.333 (a) and (b).
 - d. At all times, the Permittee shall maintain and operate the turbines in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to the NSPS, 40 CFR 60.11(d).
2. The turbines are affected units under the Acid Rain Deposition Control Program pursuant to Title IV of the Clean Air Act and are subject to certain control requirements and emissions monitoring requirements pursuant to 40 CFR Parts 72, 73 and 75. As affected units under the Acid Rain Program, the Permittee must also obtain an Acid Rain Permit for operation of the turbines in accordance with 40 CFR 70.30(a)(2)(ii) and 72.32(a).

- 3a. i. The only fuels fired in the turbines shall be natural gas and distillate fuel oil.
 - ii. The turbines, in total, shall not fire more than 3.2 million ft³ per hour and 4,870 million ft³ per year of natural gas. Compliance with the annual limit shall be determined from a running total of 12 months of data.
 - iii. The usage of fuel oil, total in the turbines, shall not exceed 8,000,000 gallons per year. This operational limitation is established to address PM emissions associated with use of fuel oil in the turbines. Compliance with this limit shall be determined from a running total of 12 months of data.
 - iv. Distillate fuel oil with a sulfur content greater than 0.05 weight percent shall not be fired in the turbines.
 - v. The fuel oil tank is subject to the New Source Performance Standards (NSPS) for storage vessels, 40 CFR 60, Subpart A and K_b. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
- b. Hourly emissions from each turbine shall not exceed the following limits, except when ice fog is deemed a traffic hazard in accordance with 40 CFR 60.332(f):

<u>Fuel Type</u>	<u>NO_x (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOM (lb/hr)</u>	<u>SO₂ (lb/hr)</u>	<u>PM/PM₁₀ (lb/hr)</u>
Gas	170.0	100.0	10.0	1.5	6.3
Oil	317.0	111.0	11.0	99.0	7.0

These limits are based on manufacturer's data as provided in the permit application. (These limits may be revised by the Illinois EPA if the Permittee demonstrates that such limits would comply with applicable requirements.) Compliance with these limits shall be based on average emission determined by emission testing in accordance with Condition 9 (3-run average) or emissions monitoring in accordance with Condition 13 (24-hour average).

- c. The total annual emissions from the turbines shall not exceed the following limitations. Compliance with these limitations shall be determined from a running total of 365 days of data.

<u>Pollutant</u>	<u>Emissions (tons/year)</u>
NO _x	240.0
CO	58.6
PM	9.0
SO ₂	24.8
VOM	15.0

The above limits are established pursuant to 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration of Air Quality (PSD) and 35 IAC Part 203, the state rules for Major Stationary Source

Construction and Modification (MSSCAM). These limitations ensure that the construction and operation of this facility project do not constitute a new major source pursuant to PSD or MSSCAM.

4. This permit is issued based on negligible emissions of organic material from the fuel oil storage tanks. For this purpose emissions from this tank combined shall not exceed a nominal emission rate of 0.44 ton/yr.
- 5a. The emission of smoke or other particulate matter from an emission unit shall not have an opacity greater than 30 percent, pursuant to 35 IAC 212.123(a), except as allowed by 35 IAC 201.149, 212.123(b) or 212.124.
 - b. For the turbines, opacity in excess of the above limit is allowed during startup in accordance with 35 IAC 201.149. Detailed provisions governing the practices that the Permittee must follow for startup to minimize such excess emissions will be established by the Illinois EPA when an operating permit is issued.
- 6a. Under this permit, each emission unit may be operated for a period of up to 180 days from initial startup to allow for equipment shakedown and emissions testing. This period may be extended by the Illinois EPA upon request of the Permittee if additional time is needed to complete startup or perform emission testing under separate fuel oil firing mode.
 - b. Upon successful completion of emission testing of the turbines demonstrating compliance with applicable limitations, the Permittee may continue to operate the facility as allowed by Section 39.5(5) of the Environmental Protection Act.
7. The Permittee shall furnish the Illinois EPA with written notification as follows:
 - a. The date construction of each turbine commenced, postmarked no later than 30 days after such date, pursuant to 40 CFR 60.7(a)(1).
 - b. The actual date of initial startup of the turbine, postmarked within 15 days after such date, pursuant to 40 CFR 60.7(a)(3).
8. This permit is issued based on the combustion turbine meeting the following requirements, so as to be considered a gas-fired peaking unit, as specified in 40 CFR Part 75, for purposes of Title IV:
 - i. The three year rolling average annual heat input from natural gas shall be greater than or equal to 90 percent of the total average annual heat input. In any one of the three averaging years, it shall also not have generated more than 15 percent average annual heat input from oil firing.
 - ii. The three year rolling average annual capacity factor shall not be greater than 10 percent for the unit, and the highest annual capacity factor shall not be greater than 20 percent in any one of the three averaging years.
 - iii. Should the operation of the turbine exceed the stated requirements relating to the definition of a gas-fired peaking unit in 40 CFR

75, the owner or operator shall install the appropriate Continuous Monitoring System(s) by December 31 of the following calendar year, as defined in 40 CFR 75, in order to remain in compliance with the provisions of the Acid Rain Program.

- 9a. Within 60 days after achieving the maximum production rate at which the stationary gas turbines will be operated, but not later than 180 days after initial startup of a turbine, the NO_x, CO and VOM, and oxygen(O₂) concentrations in the exhaust of the turbines shall be measured by an approved independent testing service in the following manner:
- i. Separate tests shall be conducted for burning of natural gas and fuel oil.
 - ii. The NO_x emission rate shall be computed for each run using the equation in 40 CFR 60.335(c)(1).
 - iii. Method 20 of 40 CFR 60, Appendix A, shall be used to determine the NO_x and O₂ concentrations. The span values shall be 300 ppm of NO_x and 21 percent O₂, pursuant to 40 CFR 60.335(c)(3).
 - iv. The NO_x emissions shall be determined across the normal operating range of the turbine, including the minimum point in the range and peak load, pursuant to 40 CFR 60.335(c)(2).
 - v. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer, pursuant to 40 CFR 60.335(c)(2).
 - vi. Method 10 of 40 CFR 60, Appendix A, shall be used to determine CO concentrations at peak turbine load.
 - vii. Method 18 or 25 of 40 CFR 60, Appendix A, shall be used to determine VOM concentrations at peak and minimum turbine load.
 - viii. The test at each load shall consist of three separate runs each at least 60 minutes in duration. Compliance shall be determined from the average of the runs provided that the Illinois EPA may accept the arithmetic mean of two of the runs in circumstances described in 40 CFR 60.8(f).
- b. Performance and certification tests shall be conducted and data collected in accordance with the test methods and procedures specified in 40 CFR 60.11, 60.335 and 40 CFR 75 for acid rain affected units. In particular, the water to fuel ratio in oil firing mode necessary for compliance shall be determined at four points in the normal operating range of the turbines.
- c. The Permittee shall submit a test plan to the Illinois EPA at least 60 days prior to testing. As part of this plan, the Permittee may propose for approval by the Illinois EPA a strategy for performing emission testing of selected turbines provided that all turbines are fitted for testing. The Permittee may also propose a strategy for testing across the normal load range of the turbines and for testing for oil firing.

The Permittee shall include the analytical methods and procedures used to determine the nitrogen content of the fuel oil being fired.

- d. The Illinois EPA shall be notified prior to these tests to enable the Illinois EPA to observe these tests. Notification of the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may, at its discretion, accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe the testing.
- e. The Final Report for these tests shall be submitted to the Illinois EPA within 60 days after the date of the tests. The Final Report shall include as a minimum:
 - i. A summary of results.
 - ii. General information.
 - iii. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.
 - iv. Detailed description of test conditions, including:
 - A. Process information, i.e., mode(s) of operation and fuel consumption (standard ft³ or gallons);
 - B. Firing rate (million Btu/hr); and
 - C. Turbine/Generator output rate (MW);
 - v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.
10. The Permittee shall install, operate, and maintain each turbine with a continuous monitoring systems to measure and record the consumption of natural gas and oil, and the ratio of water to fuel being fired, when using water injection to control NO_x emissions, pursuant to 40 CFR 60.334 (a).
- 11a. The Permittee shall sample and analyze for sulfur and nitrogen content of the fuels being fired in each CT in accordance with 40 CFR 60.334(b) unless the Permittee has a custom schedule approved by the Illinois EPA, for the determination of these values based on the design and operation of the source and the characteristics of the fuel supply.
- b. Monitoring of the fuel nitrogen content is not required while natural gas is the only fuel fired at a time in the turbine.
12. The sulfur and nitrogen content of the fuel oil shall be determined on each occasion that the fuel is transferred to the storage tank. The sulfur and nitrogen contents of the fuel shall be based on the weighted average of material in the storage tank, or the sulfur and nitrogen

contents of the supply shall be assumed to be the highest content in any shipment transferred to the tank.

- 13a. The Permittee shall maintain records of the following records on at least a quarterly basis:
 - i. The sulfur and nitrogen content of the fuel, as determined in accordance with Condition 11 and Condition 12;
 - ii. Consumption of natural gas, consumption of oil, and ratio of water to fuel being fired for each turbine, as determined in accordance with Condition 10;
 - iii. Operating hours for each turbine with mode of operation on a daily basis; and
 - iv. Emissions of NO_x, SO₂, PM, VOM and CO from the turbines for each month since the previous record with supporting calculations
- b. The Permittee shall keep a maintenance/repair log for each turbine, including a log for the water injection system on each turbine.
- c. The Permittee shall maintain following records related to startup, malfunction and breakdown, and shutdown of each turbine, including the water injection system:
 - i. The time and date of startup, malfunction or breakdown, and shutdown and confirmation that standard practices were followed; and
 - ii. Each incident when operation of a turbine continued during malfunction or breakdown with excess emissions, including the following information:
 - A. Date and duration of malfunction or breakdown;
 - B. A description of the malfunction or breakdown;
 - C. The reason continued operation was necessary, including supporting documentation; and
 - D. The corrective actions used to reduce the quantity of emissions and the duration of the incident;
- d. The Permittee shall maintain the following records on at least a quarterly basis:
 - i. Heat content of the each fuel being fired during the quarter, with supporting documentation;
 - ii. The consumption of oil by the facility for each month since the previous record and the annual consumption of oil based on a running total of 12 months of data;
 - iii. The daily emissions of NO_x, SO₂, PM, VOM and CO for each day since the previous record with supporting calculations; and

- iv. The annual emissions of NO_x, SO₂, PM, VOM and CO for each day since the previous record based on a running total of 365 days of data.
 - e. The Permittee shall maintain records that identify:
 - i. Any periods during which a continuous monitoring system was not operational, with explanation;
 - ii. Any 1-hour period during which the average water to fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined by test to be necessary to comply with requirements for NO_x emissions, with the average water-to-fuel ratio, average fuel consumption, ambient conditions and turbine load;
 - iii. Any period when the turbine was in operation during which ice fog was deemed to be a traffic hazard, the ambient conditions existing during the periods, the date and time the water injection system was deactivated, and the date and time the system was reactivated;
 - iv. Any day in which emission exceeded an applicable standard or limit; and
 - v. Any day in which emission or opacity exceeded an applicable limit standard or limit, with explanation.
 - f. These records shall be retained for at least three years at a readily accessible location at the facility and shall be available for inspection and copying by the Illinois EPA.
- 14a. Pursuant to 40 CFR 60.7(c) and 60.334(c), a report shall be submitted by the Permittee to the Illinois EPA on a quarterly basis no later than 30 days after the end of the calendar quarter. This report shall contain information on any one-hour period when the average water to fuel ratio falls below the ratio needed to show compliance. For such periods, the report shall include the actual water to fuel ratio, average fuel consumption, ambient conditions and turbine load.
- b. If there is any other exceedance of the requirements of Conditions 1 through 4 of this permit, as determined by the records required by this permit, the Permittee shall submit a report within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.
15. Two copies of required reports and notifications concerning equipment operation or repairs, performance testing, or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276

Springfield, Illinois 62794-9276
Telephone: 217/782-5811 Fax: 217/524-4710

and one copy shall be sent to the Illinois EPA's regional office at the following address, unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
1701 South 1st Avenue, 6th Floor
Maywood, IL 60153
Telephone: 708/338-7969 Facsimile: 708/338-7930

If you have any questions concerning this permit, please contact Shashi Shah at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:srs: dcaluenet/051800/finalpermit

CC: Region 1
FOIA