

217/782-2113

CONSTRUCTION PERMIT - NSPS

PERMITTEE

Unicom Power Holdings, Inc.  
Attention: Robert Nespechal  
30 West Monroe, Suite 500  
Chicago, Illinois 60603

Application No: 99100028

I.D. No.: 097125ABT

Applicants Designation: N.Chicago

Date Received: October 8, 1999

Subject: Gas Turbines (Power Production)

Date Issued: February 24, 2000

Location: 501 Foss Park Avenue, North Chicago, Lake County

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of two gas turbines (T5 and T6) (nominal plant capacity - 78 MWe) and other ancillary equipment 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<sub>x</sub>) 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 (SO<sub>2</sub>) 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. The only fuel fired in the turbines shall be natural gas.

- b. Each turbine shall be equipped, operated, and maintained with dry low NO<sub>x</sub> combustors or with water injection in the combustors.
- c. i. Hourly emissions from the GE Frame 6 turbine (Turbine 5), equipped with dry low NO<sub>x</sub> Combustors, shall not exceed the following limits:

<u>NO<sub>x</sub></u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>PM/PM<sub>10</sub></u> <u>(lb/hr)</u>	<u>VOM</u> <u>(lb/hr)</u>	<u>SO<sub>2</sub></u> <u>(lb/hr)</u>
44.9	49.0	5.0	5.1	2.6

These limits are based on the information provided in the permit application.

- ii. Notwithstanding the above, when operating load is less than 75% or ambient temperature is less than 59°F, carbon monoxide (CO) and nitrogen oxides (NO<sub>x</sub>) emissions shall not exceed 212.7 lb/hr and 87.6 lb/hr, respectively.
- d. i. Hourly emissions from the GE Frame 6 turbine (Turbine 6), which is equipped with water injection, shall not exceed the following limits except when ice fog is deemed a traffic hazard by the Permittee:

<u>NO<sub>x</sub></u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>PM/PM<sub>10</sub></u> <u>(lb/hr)</u>	<u>VOM</u> <u>(lb/hr)</u>	<u>SO<sub>2</sub></u> <u>(lb/hr)</u>
81.2	46.5	5.0	5.1	2.8

These limits are based on information provided in the permit application.

- ii. Notwithstanding the above, when ambient temperature is less than 59°F, carbon monoxide (CO) shall not exceed 90.2 lb/hr.
- e. The turbines, in total, shall not fire more than 1,439 million ft<sup>3</sup> of natural gas per year. Compliance with this limit shall be determined from a running total of 12 months of data.
- f. The annual emissions from the facility turbines (Total 2 turbines) shall not exceed the following limitations. Compliance with these limitations shall be determined from a running total of 12 months of data. For this purpose, a turbine shall be assumed to emit at the applicable limits as specified above, or the value measured with a continuous emission monitoring system.

<u>Pollutant</u>	<u>Emissions</u> <u>(tons/year)</u>
NO <sub>x</sub>	99.3
CO	76.5
PM/PM <sub>10</sub>	9.0
VOM	2.6
SO <sub>2</sub>	4.2

The above limits are established pursuant to 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration of Air Quality (PSD) and the state rules for Major Stationary Source Construction and Modification (MSSCAM), 35 IAC, Part 203. These limitations ensure that the construction and operation of the turbines do not constitute a new major source pursuant to PSD or MSSCAM.

4. The emission of smoke or other particulate matter from each turbine 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.
5. Emissions of PM from the cooling tower shall not exceed 4 lb/day and 0.4 ton/yr. These limits are based on USEPA emission factors from AP-42 and engineering calculations.
6. This permit is issued based on the source not being a participating source or new participating source under the Emission Reduction Market System (ERMS) [35 IAC Part 205], because the source's VOM emissions are less than the 10 ton/season applicability threshold of the ERMS.
- 7a. Under this permit, each turbine may be operated for a period of up to 180 days from initial startup to allow for equipment shakedown and emissions testing as required. 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.
- b. Upon successful completion of emission testing demonstrating compliance with applicable limitations, the Permittee may continue to operate the turbines as allowed by Section 39.5 (5) of the Environmental Protection Act.
8. The Permittee shall furnish the Illinois EPA with written notification as follows:
  - a. The date construction of the turbines 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 turbines, postmarked within 15 days after such date, pursuant to 40 CFR 60.7(a)(3).
9. Each turbine shall each be equipped, operated, and maintained with a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired (for Turbine 6), pursuant to 40 CFR 60.334(a).
- 10a. The Permittee shall monitor sulfur content of the gas fired in the turbines pursuant to the applicable provisions in 40 CFR Part 75, Appendix D, Section 2.3 for pipeline natural gas combustion.
- b. Monitoring of fuel nitrogen content is not required, as natural gas is the only fuel fired in the turbines.
- c. The above provisions establish a custom schedule for determination of sulfur content and nitrogen content of fuel in accordance with 40 CFR 60.334 (b)(2) and USEPA's Custom Fuel Monitoring Document dated August 14, 1987.

- 11a. This permit is issued based on the turbines being gas-fired peaking units, as specified in 40 CFR Part 75, so that continuous emission monitoring is not required for NO<sub>x</sub>. To maintain this status, the three year rolling average annual capacity factor of a turbine shall not be greater than 10 percent, and the highest annual capacity factor shall not be greater than 20 percent in any one of the three averaging years.
  - b. Should the operation of a turbine exceed the above requirements relating to the definition of a gas-fired peaking unit in 40 CFR 75, the Permittee shall install the appropriate Continuous Monitoring System(s) on the turbine 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.
- 12a.
    - i. Within 60 days after achieving the maximum production rate at which the turbines will be operated, but not later than 180 days after initial startup, the nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic material (VOM) and oxygen (O<sub>2</sub>) concentrations in the exhaust of the turbines shall be measured to determine compliance with the NO<sub>x</sub>, CO and VOM limits in Condition 1 and 3 in the following manner:
      - A. The NO<sub>x</sub> emission rate shall be computed for each run using the equation in 40 CFR 60.335(c)(1).
      - B. Method 20 of 40 CFR 60, Appendix A, shall be used to determine the NO<sub>x</sub> and O<sub>2</sub> concentrations. The span values shall be 300 ppm of NO<sub>x</sub> and 21 percent O<sub>2</sub>, pursuant to 40 CFR 60.335(c)(3).
      - C. The NO<sub>x</sub> emissions shall be determined at four points in the normal operating range of the turbines, including the minimum point in the range and peak load, pursuant to 40 CFR 60.335(c)(2) to determine the water to fuel ratio necessary for compliance in the normal operating range of the turbines.
      - D. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer, pursuant to 40 CFR 60.335(c)(2).
      - E. Method 10 of 40 CFR 60, Appendix A, shall be used to determine CO concentrations at peak turbine load.
      - F. Method 18 of 40 CFR 60, Appendix A, shall be used to determine VOM concentrations at peak turbine load.
      - G. 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).
    - ii. Measurements of pollutants concentration in the exhaust from the turbines shall promptly be measured following a written request for such measurements from the Illinois EPA.

- b. Performance and certification tests shall be conducted by an approved independent testing service. Tests shall be performed in accordance with applicable USEPA test methods and procedures specified in 40 CFR 60.11, 60.335 and 40 CFR 75 for acid rain affected units or otherwise using applicable USEPA Reference Test Methods of 40 CFR 60, Appendix A.
  - 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.
  - 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 thirty (30) days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of five (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. Fuel consumption (standard ft<sup>3</sup>);
      - 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.
- 13a. The Permittee shall maintain records of the following items:
- i. The sulfur content of the fuel used to fire the turbines as determined in accordance with Condition 10;
  - ii. Fuel consumption (for both turbines) and ratio of water to fuel (for Turbine 6) being fired as monitored in accordance with Condition 9;

- iii. Operating hours and fuel consumption for the turbines, on a daily basis;
  - iv. Ambient temperature, by hour, for each hour in which a turbine operates when the ambient temperature is less than 59<sup>0</sup>F; and
  - v. Design calculation for particulate matter emissions from the cooling tower, with supporting data for design water flow rate, maximum solids content of water, and tower drift rate.
- b. The Permittee shall keep a maintenance/repair log for each turbine, including a log for the water injection system for Turbine 6.
- c. The Permittee shall maintain the following records on at least a quarterly basis:
- i. Heat content of the natural gas (Btu/ft<sup>3</sup>) being fired during the quarter, with supporting documentation;
  - ii. Fuel consumption and operating hours for each turbine for each month since the previous record; and
  - iii. The annual emissions of NO<sub>x</sub>, SO<sub>2</sub>, PM, VOM and CO for each month since the previous record with supporting calculations.
- d. 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<sub>x</sub> 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 and/or opacity exceeded an applicable standard or limit.
- e. These records shall be retained for at least three years 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 quarters. 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. This report shall

also include any periods when a turbine operated without water injection because ice fog was deemed a traffic hazard.

- b. If there is any exceedance of the requirements of Conditions 1 through 4 of this permit, as determined by the records required by this permit or by other means, 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: 217/782-6348

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 - Regional Office  
1701 South 1<sup>st</sup> Avenue, 12<sup>th</sup> Floor  
Maywood, IL 60153

Telephone: 708/338-7969      Fax: 708/338-7930

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

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

DES:MNP

CC: Region 1