



based on lower heating value of fuel as measured and actual peak load for the facility. The value of  $Y$  shall not exceed 14.4 kilojoules per watt-hour.

F = NO<sub>x</sub> emission allowance for fuel-bound nitrogen as defined in 40 CFR 60.332 (a)(3).

- c. The Permittee shall not emit into the atmosphere from any turbine any gases which contain sulfur dioxide 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).
  3. The turbines shall be equipped, operated, and maintained with Low NO<sub>x</sub> combustors.
  - 4a. The only fuel fired in the turbines and natural gas heaters shall be natural gas.
  - b. The total natural gas consumption of the turbines shall not exceed 12,333 million ft<sup>3</sup> per year. Compliance with this limit shall be determined from a running total of 12 months of data.
  - c. i. Hourly emissions from each turbine shall not exceed the following limits, except during startup and shutdown (see Condition 5(b)). These emission limits are based on the data provided in the application for maximum emissions. For NO<sub>x</sub>, these limits reflect achievement of an emission rate of 15 ppmd at 15% O<sub>2</sub> (0.062 lb NO<sub>x</sub>/million Btu):

Unit	NO <sub>x</sub> (Lb/Hr)	CO (Lb/Hr)	PM/PM <sub>10</sub> (Lb/Hr)	VOM (Lb/Hr)	SO <sub>2</sub> (Lb/Hr)
Smaller Turbines (CTG1, CTG2, CTG3 and CTG4)	55	63	43	25	2.4
Larger Turbines (CTG5 and CTG6)	99	31	73	42	4.0

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

- ii. Notwithstanding the above, when ambient temperature is less than 50°F hourly NO<sub>x</sub> emissions from the turbines shall not exceed 63 and 108 lb/hour each and for the smaller and larger turbines, respectively.
- d. The annual emissions of the gas heaters shall not exceed 0.60, and 0.51 tons per year of nitrogen oxides and carbon monoxide, respectively.
- e. i. The total annual emissions of the six turbines shall not exceed the following limitations, as further detailed in Table 1. Compliance with these annual limitations shall be determined from a running total of 12 months of emission data.

<u>Pollutant</u>	<u>Emissions (Tons/Year)</u>
NO <sub>x</sub>	213.0
CO	245.0
PM/PM <sub>10</sub>	230.0
VOM	131.0
SO <sub>2</sub>	12.5

- ii. For purposes of determining compliance with the above limitations:
  - A. Unless emission monitoring is performed for a pollutant, emissions during periods other than startup shall be determined from emission factors developed from testing in accordance with Condition 11 (NO<sub>x</sub>, CO, VOM and PM/PM<sub>10</sub>) and analysis of fuel sulfur content or standard factor (SO<sub>2</sub>).
  - B. Unless an alternative factor is established for the pollutant or emission monitoring is performed for the pollutant, emissions during an hour that includes a startup shall be assumed to be at the limits in Condition 4(c), except for CO emissions from the larger turbines, which shall be assumed to be 400 percent higher than the limit in Condition 4(c) (i.e., 124 lb/hour rather than 31 lb/hour). These assumptions are based on data in the application, which indicates that except for CO emissions from the larger turbines emissions during startup are no greater than emissions during normal operation. Any alternative factor for emissions during startup of turbines shall be based on representative emission testing conducted with USEPA Reference Test Methods.
- f. Annual emissions of hazardous air pollutants shall be less than 10 tons of any hazardous pollutant and less than 25 tons in aggregate for any

combination of hazardous air pollutants, as indirectly addressed by limits on emissions of criteria pollutants.

The above limitations are established pursuant to 40 CFR 52.21, the federal rules for Prevention of Significant Deterioration of Air Quality (PSD). These limits ensure that the construction and operation of the power plant does not constitute a new major source pursuant to PSD. These limits also ensure that this project is not subject to review under Section 112(g) of the Clean Air Act.

- 5a. 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 below (35 IAC 201.149, 212.123(b) or 212.124).

- b. i. The Permittee is authorized to operate the turbines in excess of 30 percent opacity during startup pursuant to 35 IAC 201.262, provided that all reasonable efforts are made to minimize startup emissions. This authorization only extends for a period of up to 24 minutes following the initial firing of fuel during each startup event or the end of startup, whichever occurs first.
  - ii. Each turbine shall be operated in a manner consistent with good air pollution control practice to minimize emissions associated with during startup and shutdown including the following. These practices shall be reviewed at least annually and enhanced consistent with good air pollution control practice based on actual operating experience and performance of the turbines.
    - A. The Permittee shall manage the operation of the turbines to provide adequate time for normal startup of the turbines, except for emergencies, and to minimize multiple startups of a turbine in a single day, unless startup is tripped off.
    - B. The Permittee shall operate in accordance with the manufacturer's written instructions or other written instructions developed and maintained by the Permittee, which shall include at a minimum the following measures:
      - Review of operating parameters of the unit during startup, or shutdown as necessary to make adjustments to reduce emissions;
      - Implementation of inspection and repair procedures for a turbine prior to attempting startup following repeated trips.
    - C. Maintenance of the turbines in accordance with written procedures developed and maintained by the Permittee.
- 6a. Under this permit, the turbines 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 short-term emission limits, the Permittee may continue to operate the turbines as allowed by Section 39.5 (5) of the Environmental Protection Act.
- c. This condition supersedes Standard Condition 6.

7. 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). (This notification may be provided when construction activity is commenced for the proposed source.)
  - 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).
8. Each turbine shall be equipped, operated, and maintained with a continuous monitoring system to monitor and record the fuel consumption, pursuant to 40 CFR 60.334 (a).
- 9a. The Permittee shall determine sulfur content of the natural gas fired in the turbines in accordance with the applicable provisions in 40 CFR 75, Appendix D, Section 2.3.2 for pipeline natural gas combustion.
- b. The Permittee shall sample and analyze for sulfur and nitrogen content of the natural gas being fired in the turbines in accordance with 40 CFR 60.334(b) unless alternative provisions are approved by USEPA, in which case the Permittee shall comply with such alternate provisions.
- 10a. 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. (Annual capacity factors of 10 and 20 percent are equivalent to operating for 876 and 1,752 hours per year, respectively at full load.).
- 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.
- c. The turbines, as installed, shall be equipped with facilities, i.e., sampling ports, appropriate platforms and access and associated utilities, to allow continuous emissions monitoring systems to be readily installed and operated in accordance with 40 CFR Part 75.
- 11a. Within 60 days after operating a turbine at the greatest load at which it will normally be operated but not later than 180 days after its initial startup, the nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic material (VOM), particulate matter (PM), and oxygen

(O<sub>2</sub>) concentrations in the exhaust of the turbine and the opacity of exhaust shall be measured by an approved independent testing service as follows to determine compliance with the emissions limits in Condition 2, 4, 5 and 6:

b. The following methods and procedures shall be used for testing of emissions:

i. The following USEPA test methods shall be used:

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Stack Gas Analysis	USEPA Method 3 or 3A
Stack Gas Moisture Content	USEPA Method 4
Opacity	USEPA Method 9
Carbon Monoxide	USEPA Method 10
Volatile Organic Material	USEPA Method 18 or 25A
Nitrogen Oxides	USEPA Method 20
Particulate Matter	USEPA Method 5
Particulate Matter <sub>10</sub>	USEPA Method 201 or 201A (40 CFR 51, Appendix M)

ii. Measurements for NO<sub>x</sub> shall be conducted in accordance with 40 CFR 60.335, as specified below, unless alternative testing procedures are approved by USEPA pursuant to 40 CFR 60.8(b):

- A. The NO<sub>x</sub> emissions shall be computed for each run using the equation in 40 CFR 60.335(c)(1).
- B. The span values for Method 20 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).
- 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).

iii. Measurements for other pollutants shall be conducted as follows:

- A. CO, PM and VOM concentrations shall be measured at peak and minimum CT load.
- B. PM emissions measured by USEPA Method 5, including back half condensable particulate, may be provided as an alternative

to measurement of PM<sub>10</sub> emissions using USEPA Method 201 or 201A.

- C. Measurements for VOM and organic hazardous air pollutants in the VOM (e.g., formaldehyde, toluene, acetaldehyde, and acrolein) shall be provided by Method 18, unless the Permittee demonstrates by testing of VOM emissions by Method 25A that VOM emissions of the facility will be less than 25 tons/year. (See also Condition 11(c)(iii).)
- c. At least 60 days prior to the actual date of testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing and shall include as a minimum:
    - i. The person(s) who will be performing sampling and analysis and their experience with similar tests.
    - ii. The specific conditions under which testing shall be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the turbines will be tracked and recorded.
    - iii. The specific determinations of emissions that are intended to be made, including sampling and monitoring locations and identification of organic hazardous air pollutants that will be measured. As part of this plan, the Permittee may set forth a strategy for performing emission testing of selected turbines provided that all turbines are fitted for testing; the identity of the turbines to be tested is determined immediately before testing; by the Illinois EPA or otherwise randomly; and continuous emission monitoring of NO<sub>x</sub> is present on all turbines. The Permittee may also propose a plan for testing across the normal operating range of the turbines.
    - iv. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.
  - 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.
- 12a. The Permittee shall maintain records of the following items:
  - i. Heat content of the natural gas (Btu/ft<sup>3</sup>) being fired during the quarter, with supporting documentation on at least a quarterly basis;
  - ii. The sulfur content of the fuel used to fire the turbines as determined in accordance with Condition 9(a). (If the standard emissions factor is used, records shall be kept for any measurements or data on actual sulfur content.); and
  - iii. Fuel consumption for each turbine as monitored in accordance with Condition 8.
  - iv. A copy of the Final Report(s) for emissions testing conducted pursuant to Condition 11.
- b. The Permittee shall maintain operating logs for each turbine which at a minimum shall include daily information for operating hours and fuel consumption and periods of time when inlet air cooling is used.
- c. The Permittee shall maintain the following records related to startup of the turbines:
  - i. The following information for each startup of the turbines:

- A. Date and time of startup;
  - B. Type of startup, i.e.; scheduled or emergency;
  - C. Whether operating personnel for the turbines or air environmental staff are on site during startup; and
  - D. A description of the startup, if written operating procedures are not followed during the startup or operating problems occur during the startup, including detailed explanation.
- ii. The following information for the turbines when above normal opacity has been observed by source personnel as identified in (i)(B) above:
    - A. Name of observer, position and reason for being at site;
    - B. Date and duration of above normal opacity, including start time and time normal operation was achieved;
    - C. If normal operation was not achieved within 24 minutes, an explanation why startup could not be achieved;
    - D. A detailed description of the startup, including reason for operation and whether reduced loading was performed;
    - E. An explanation why reduced loading and other established startup procedures could not be performed, if not performed;
    - F. The nature of opacity following the end of startup or 24 minutes of operation, whichever occurs first, and duration of operation until achievement of normal opacity or shutdown; and
    - G. Whether exceedance of Condition 5(a) [30 percent opacity] may have occurred during startup, with explanation if qualified observer was on site.
- d. The Permittee shall keep a maintenance/repair log for each turbine.
  - e. The Permittee shall maintain the following records related to emissions:
    - i. Other data, not addressed above used or relied upon by the Permittee to determine emissions.
    - ii. The emissions of NO<sub>x</sub>, SO<sub>2</sub>, PM, VOM and CO from the turbines for each day since the previous record with supporting calculations which records shall be compiled on at least a monthly basis.

- f. The Permittee shall maintain records that identify:
  - i. Any periods during which a continuous monitoring system was not operational, with explanation.
  - ii. Any day in which emission exceeded an applicable standard or limit.
- g. These records shall be retained for at least three years and shall be available for inspection and copying by the Illinois EPA.
- 13a. The Permittee shall notify the Illinois EPA within 10 days if NO<sub>x</sub> or CO emissions exceed 150 tons/ year.
- 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.
- 14. 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      Facsimile: 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  
2009 Mall Street  
Collinsville, Illinois 62234

Telephone: 618/346-5120      Facsimile: 618/346-5155

- 15. This Permit for the above referenced project does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as all other applicable Federal, State, and Local requirements.

Page 13

Please note that additional rules addressing NO<sub>x</sub> emissions from these turbines may be adopted in the near future in response to USEPA's so called "NO<sub>x</sub> SIP call" and the development of Illinois's plans for attainment of the ozone air quality standard in the Chicago and Metro-East ozone nonattainment areas.

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

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

DES:YB:psj

cc: Region 3

I.D. No.: 025804AAC  
 Application No.: 00030053  
 Entergy Power Generation Corporation

**Attachment A**

Emission Units

<u>Description</u>	<u>Manufacturer</u>	<u>Number</u>	<u>Rated Heat Input<sup>1</sup> (mmBtu/hr)</u>	<u>Rated Electrical Output<sup>1</sup> (MW<sub>e</sub>)</u>	<u>Control</u>
Smaller Turbines CTG1, CTG2, CTG3, and CGT4	GE	4	788	73	Low NO <sub>x</sub> Combustors
Larger Turbines CTG5 andCTG6	GE	2	1,434	148	Low NO <sub>x</sub> Combustors
Gas Fired Fuel Heaters		6	6.7 (Total)	---	Low NO <sub>x</sub> Burners
Emergency Fire Water Pump		1	0.77		

1. Nominal ratings are based on lower heating value and are per unit.

Table 1

Project Emissions (ton/year)

<u>Unit</u>	<u>NO<sub>x</sub></u>	<u>CO</u>	<u>PM</u>	<u>VOM</u>	<u>SO<sub>2</sub></u>
Smaller Turbines	110.0	180.0	121.0	68.0	6.5
Larger Turbines	102.0	64.0	109.0	63.1	6.0
Gas Fired Heaters	0.60	0.51	0.05	0.03	0.01
Emergency Fire Water Pump	0.68	0.15	0.05	0.06	0.04
Totals:	213.0	245.0	230.0	131.0	12.5

YB:psj