217/785-1705

CONSTRUCTION PERMIT

PERMITTEE

Elgin Energy Center LLC
Attn: Robert Rapenske
1559 Gifford Road
Elgin, Illinois 60120

Application No.: 15070001 I.D. No.: 031438ABC
Applicant's Designation: DUAL-FUEL Date Received: August 14, 2015
Subject: Oil-Burning Capability for Combustion Turbines
Date Issued: Draft (September 4, 2016)
Location: 1559 Gifford Road, Elgin, Cook County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of fuel oil firing by the combustion turbines, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

a. This permit addresses burning of fuel oil in the four combustion turbines (Units CT1 through CT4) at this peaking power plant. This will enable this plant to provide electrical power when natural gas for the plant is restricted or curtailed, as may occur during winter months. The oil will be ultra-low sulfur diesel (ULSD) fuel. The emissions of nitrogen oxides (NOx) from Units CT1 through CT4 are currently controlled by low-NOx combustion technology. As part of this project, water injection systems will be added to these units for use when burning oil.

This permit also addresses operation of the turbines during tuning of their combustion systems. These systems may be tuned several times each year to maintain efficient operation.

b. For purposes of this permit, the four combustion turbines are referred to as the "affected turbines." The operation of these turbines burning fuel oil is referred to as "operation with oil."

2. Coordination with Other Permits

a. Except as specifically indicated, this permit does not alter requirements for the affected turbines in Construction Permit 00100065 and the Clean Air Act Permit Program (CAAPP) Permit for the plant (Permit 03080009).

3-1. Applicable Federal Emission Standards

a. As a result of this project, the affected turbines will become subject to the federal New Source Performance Standards (NSPS) for Stationary Combustion Turbines, 40 CFR 60 Subpart KKKK. This is because the project will entail modification of the turbines, since the maximum hourly rates of NOx and SO_2 emissions when firing oil will be higher than when firing natural gas.

b. Pursuant to 40 CFR 60.7(c), 60.4320 and 60.4325 and Table 1 of 40 CFR Subpart KKKK, NOx emissions from each affected turbine, corrected to 15 percent oxygen (O_2) in the exhaust, shall not exceed the following limits except during periods of startup, shutdown and malfunction, as defined by 40 CFR 60.2. If the total heat input of an affected turbine is greater than or equal to 50 percent natural gas, the turbine must meet the corresponding limit for a natural gas-fired turbine when burning that fuel. Similarly, when the affected turbine's total heat input is greater than 50 percent oil, the turbine must meet the corresponding limit for oil for the duration of the time that that particular fuel is burned.

   i. Turbines CT1 through CT4:

      A. For natural gas, 15 ppm.

      B. For oil, 42 ppm.

c. Pursuant to 40 CFR 60.4330(a), SO_2 emissions from each affected turbine shall comply with one of the following limits:

   i. Emissions shall not exceed 0.90 lbs/MWh gross output; or

   ii. The total potential emissions shall not exceed 0.060 lbs SO_2/mmBtu heat input for each fuel fired in the turbine.

d. Pursuant to 40 CFR 60.11(d), at all times, including periods of startup, shutdown and malfunction, the Permittee shall, to the extent practicable, maintain and operate the affected turbines, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions.

   Note: When an affected turbine first operates after being modified to burn oil and becomes subject to the requirements of 40 CFR 60 Subpart KKKK, it will no longer be subject to the emission standards and other requirements of the NSPS for Stationary Gas Turbines, 40 CFR 60 Subpart GG, as are addressed in existing permits.

3-2. Applicable State Emission Standards

a. Pursuant to 35 IAC 217.706, the Permittee shall not cause or allow the emissions of NOx into the atmosphere from each affected turbine during each ozone control period to exceed 0.25 lbs/mmBtu of actual heat input, average for the ozone control period.

b. Pursuant to 35 IAC 217.388(a)(1)(E) and (F), the NOx emissions of each affected turbine, corrected to 15 percent oxygen on a dry basis, shall not exceed 42 ppmv for gaseous fuel and 96 ppmv for liquid fuel.

c. Pursuant to 35 IAC 214.301, the emission of sulfur dioxide into the atmosphere from each affected turbine shall not exceed 2000 ppm.

3-3. Applicable Programs for Allowance Trading

a. The affected turbines are affected units under the Acid Rain Control Program pursuant to Title IV of the Clean Air Act and are subject to certain requirements pursuant to 40 CFR Parts 72, 73 and 75. As affected units under the Acid Rain Program, the Permittee must hold allowances for the SO_2 emissions of the turbines.

b. The affected turbines qualify as Electrical Generating Units (EGU) for purposes of the Cross State Air Pollution Rule (CSAPR), i.e., 40 CFR Part 97. As such, the Permittee must hold allowances for the NOx and SO_2 emissions of the affected turbines during each calendar year and seasonal control period (NOx only).

4. Non-Applicability Provisions

a. i. This permit is issued based on this project not constituting a major project for purposes of the rules for the Prevention of Significant Deterioration (PSD) 40 CFR 52.21. This is because it will not be accompanied by significant increases in emissions of pollutants regulated under PSD.

ii. This permit is issued based upon this project not being a major project for purposes of Illinois' rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because the NOx and VOM emissions of the affected turbines from burning oil and tuning will not be significant.

b. When each affected turbine first operates after being modified to burn oil, the turbine will no longer be subject to the NSPS for Stationary Gas Turbines, 40 CFR 60 Subpart GG. This is because the requirements of 40 CFR 60 Subpart KKKK will begin to apply.

c. This permit is issued based on the affected turbines not being subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines, 40 CFR 63 Subpart YYYY. This is because this NESHAP only applies to major sources of hazardous air pollutants (HAPs) and this plant is not a major source for HAP.

d. This permit is issued based on the affected turbines not being subject to 35 IAC Part 217 Subpart M, Electrical Generating Units. This is because these rules only address fossil fuel-fired boilers.

e. This permit is issued based on the affected turbines not being subject to 35 IAC 212.321. This is because a process weight rate cannot be determined for turbines and this rule cannot reasonably be applied.

5. Operating Requirements

a. The nominal heat input capacity of each of the affected turbines when burning natural gas or oil shall not exceed 1472 mmBtu/hr, on a higher heating value (HHV) basis.

b. In the affected turbines, the Permittee shall only burn oil that meets the requirements for ultra-low-sulfur diesel fuel in 40 CFR 80.510(c).

c. i. Each affected turbine shall not operate in the tuning mode for more than 24 hours/year.

ii. The affected turbines, combined, shall not burn more than 500,000 mmBtu of oil/year.

iii. Compliance with the limits in Conditions 5(c)(i) and (ii) shall be determined from a running total of 12 months of data.

d. The turbines, in total, shall not operate more than 5,744 hours per year. Compliance with this limit shall be determined from a running total of 12 months of data from the sum of operating hours counted as set forth below:

i. Each hour of operation for an affected turbine operating with wet compression on for power augmentation shall be counted as 1.55 hours. For this purpose, wet compression for power augmentation means introducing water into the inlet air duct immediately before the compressor section of the turbine following achievement of base power output to increase power output from the turbine;

ii. Each startup hour for an affected turbine shall be counted as 1.2 hours; and

iii. Each hour of operation for an affected turbine operating in other modes than identified in Condition 3(c)(i) and (ii) shall be counted as 1 hour.

e. i. Each turbine shall be equipped, operated, and maintained with dry low NOX combustors to control NOx emissions when burning natural gas and water injection systems when burning oil.

6. Emission Limits

a. Except for periods of startup and shutdown, the NOx emissions of each affected turbine, hourly average, corrected to 15 percent oxygen in the exhaust, shall not exceed:

i. When burning natural gas:

A. 15 ppmvd, except for tuning;

B. 20 ppmvd, for tuning.

ii. When burning oil:

A. 42 ppmvd, except for tuning;

B. 53 ppmvd, for tuning.

b. Hourly emissions from each affected turbine, in pounds/hour, shall not exceed the following limits:

i. When burning natural gas:

	Units CT1 - CT4
NOx	82.0 (100.0*/106.4**)
CO	66.0 (259.0*)
PM/PM_{10}	10.0
VOM	2.8 (10.0*)
SO_2	0.9
HAPs	1.69

ii. When burning oil:

	Units CT1 - CT4
NOx	227.0 (235.0*/291.0**)
CO	182.4 (263.0*)
PM/PM_{10}	29.3
VOM	24.5 (25.0*)
SO_2	2.22
HAPs	0.32

* Limit applies during startup and shutdown only
** Alternative limit applies during tuning

Note: The emission limits in Condition 6(b)(ii) replace previous limits for the affected turbines when burning natural gas.

c. If an affected turbine burns both natural gas and oil during an hour, compliance with the emission limits in Conditions 6(a) and (b) shall be determined as follows:

i. On a weighted basis using the percentage of the heat input provided by natural gas and by oil. For example, for Unit CT1, if during such an hour, each fuel provides half the heat

input to the turbine, the concentration limit for NOx would be 28.5 ppmvd [(0.5 x 15 ppmvd) + (0.5 x 42 ppmvd) = 28.5 ppmvd].

ii. Notwithstanding the above, if both natural gas and oil are both burned during an hour that includes a startup, the limits for oil shall apply.

d. The annual emissions from the affected turbines when burning oil, including emissions during startup and shutdown, and during tuning, shall not exceed the following limits. Compliance with these annual limits shall be determined from a running total of 12 months of data with emissions calculated from operating data and emission factors determined from testing (NO_X, CO and VOM) or standard emission factors (SO_2 and PM/PM_{10}).

Pollutant	Emissions (Tons/Year)
NOx	39.2
CO	13.9
PM/PM_{10}	5.1
VOM	1.3
SO_2	0.4
HAPs	1.3

Note: The combined annual natural gas usage of the affected turbines is limited to 8,220 million standard cubic feet/year. The combined annual emissions of the plant, including both the affected turbines and ancillary equipment, are subject to the following limits. These limits apply on a running total of 365 days.

Pollutant	Emissions (Tons/Year)
NO_X	235.5
CO	237.0
PM/PM_{10}	42.2
VOM	11.7
SO_2	2.9
HAPs	8.1

7-1. Emission Testing Requirements

a. Pursuant to the NSPS, 40 CFR 60.8, the Permittee shall have initial performance tests conducted for the affected turbines for emissions of NOx and SO_2 in accordance with 40 CFR 60.8 using applicable methods and procedures specified by 40 CFR 60.4400 and 60.4415.

Note: Testing of NOx emissions using the procedures and methods in 40 CFR 60.4400 is also required by 35 IAC 217.388(c)(2).

b. i. Within 60 days after achieving the maximum production rate at which Units CT1 through CT4 will be operated with oil but not

later than one year after initially burning of oil in these turbines, the Permittee shall have tests conducted for emissions of VOM and CO as follows at its expense by an approved testing service. One test shall be conducted for two of the affected turbines, as selected by the Illinois EPA. These tests shall be conducted while the subject turbines are operating in their maximum load range.

ii. A. For purposes of this emission testing, the following methods and procedures shall be used unless other methods adopted by or being developed by USEPA are specified or approved by the Illinois EPA.

Location of Sample Points	Method 1
Gas Flow and Velocity	Method 2
Flue Gas Weight	Method 3 or 3A
Moisture	Method 4
Volatile Organic Material	Method 18, 25A or 320
Carbon Monoxide	Method 10

B. If visible emissions are typically present from the turbine when burning oil, the Permittee shall also conduct observations for opacity by Method 9 during the emission tests.

iii. A. Test plans, test notifications, and test reports shall be submitted to the Illinois EPA Air Compliance Section. In addition to other required information, if test runs that are longer than one-hour in duration are planned, the expected duration of the runs and the reason for extended runs shall be explained.

B. In addition to other information required in a test report, test reports shall include detailed information on the operating conditions of an affected turbine during testing, including:

1. Fuel consumption (in scf/hour for gas and gallons/hour for oil);

2. Firing rate (mmBtu/hour) and other significant operating parameters of the affected turbine;

3. Control measure operating rates or parameters, including water injection flowrate (gallons/minute) and water-to-fuel ratio;

4. Turbine/Generator output rate (MWe gross); and

5. If observations of opacity are required, opacity of the exhaust from the affected turbine, 6-minute averages.

7-2. Periodic Measurements of Emissions

a. For Turbines CT1 through CT4, the Permittee shall conduct periodic performance tests for NOx emissions in accordance with 40 CFR 60.4340(a) if it does not conduct operational or emissions monitoring in accordance with 40 CFR 60.4340(b).

b. For each affected turbine, the Permittee shall conduct periodic measurements of the NOx emissions as required by 35 IAC 217.394(d).

c. The Permittee shall perform emission tests as specified by Condition 7-1(a) or (b) as requested by the Illinois EPA for an affected turbine within 45 days of a written request by the Illinois EPA or such later date agreed to by the Illinois EPA.

Note: Further requirements for periodic emission testing may be established in the CAAPP Permit for the plant.

8. Operational Monitoring and Instrumentation

a. i. Pursuant to 40 CFR 60.4335(a), the Permittee shall install, calibrate, maintain and operate a continuous monitoring system on each affected turbine to monitor and record the fuel consumption and the ratio of water to fuel being fired in the affected turbine. For Turbines CT1 through CT4, this monitoring system need only be operated whenever the turbine is burning oil and the water injection system must be used.

ii. For Turbines CT1 through CT4, the Permittee shall conduct NOx emission monitoring or operational monitoring in accordance with 40 CFR 60.4340(b) if it does not conduct periodic performance tests for NOx emissions in accordance with 40 CFR 60.4340(a). (See Condition 7-2(a).)

b. Pursuant to 40 CFR 60.4360, the Permittee shall monitor the total sulfur content of the fuel being fired in the turbine, except as provided in 40 CFR 60.4365. The sulfur content of the fuel must be determined using total sulfur methods described in 40 CFR 60.4415, at the frequency required in 40 CFR 60.4370. Per Table D-5 of 40 CFR 75, Appendix D, no fuel sampling is required if the source can demonstrate pipeline quality natural gas is utilized and that the fuel contract or tariff sheet limits the fuel sulfur content to less than or equal to 0.5 grains S per 100 scf (equivalent to 0.0006 lb of SO_2 per million Btu). For oil fuel, the source can demonstrate compliance by ensuring that the vendor oil deliveries meet the ULSD limit of <0.0015 percent sulfur by weight.

Note: For each affected turbine beginning when oil is first fired, the monitoring required by 40 CFR 60 Subpart KKKK will take the place of the monitoring previously required by 40 CFR 60 Subpart GG.

b. The Permittee shall install, evaluate, operate, and maintain meters to measure and record the gross electrical output of the generator associated with each affected turbine.

9. Recordkeeping Requirements

a. For the affected turbines, the Permittee shall keep applicable records required by the NSPS, including 40 CFR 60.8(c), 60.4375, 60.4380 and 60.4385.

b. For the affected turbines, the Permittee shall keep applicable records required by 35 IAC 217.396(a).

c. For the affected turbines, the Permittee shall keep an operating log or other operating records that at a minimum include information for each time that oil is burned or a turbine is tuned, including date, duration and amount of fuel burned.

d. For the affected turbines, the Permittee shall keep records of the following information:

i. The combined usage of fuel oil (mmBtu/month and mmBtu/year).

ii. For each turbine, the duration of tuning (hours/month and hours/year).

e. The Permittee shall keep inspection, maintenance, and repair logs with dates and the nature of such activities for each affected turbine.

f. For the affected turbines, the Permittee shall keep the following records related to emissions of NOx, CO, PM/PM_{10}, VOM and SO_2.

i. A file containing the maximum hourly emission rates of the affected turbines in each mode of operation (pounds/hr), with supporting documentation and calculations.

ii. Records of actual emissions of each affected turbine in each mode of operation (pounds/day, tons/month and tons/year), with supporting calculations.

iii. Records of the combined emissions of the affected turbines (pounds/day, tons/month and tons/year).

g. All records and logs required by this permit shall be retained and be available for inspection and copying as provided by the CAAPP permit for the plant.

10. Reporting Requirements

a. For the affected turbines, the Permittee shall fulfill applicable reporting requirements of the NSPS, including 40 CFR 60.4375, 60.4380 and 60.4385.

b. For the affected turbines, the Permittee shall provide a copy of any submittals to USEPA related to performance testing for NOx or SO_2 emissions, including:

i. Notifications related to force majeure events that delay or will delay testing beyond the regulatory deadline, as provided for by 40 CFR 60.8(a)(1) and (2).

ii. Petitions to use equivalent or alternative test methods or to waive the requirement for testing of all affected turbines, as provided for by 40 CFR 60.8(b).

c. For the affected turbines, the Permittee shall fulfill applicable reporting requirements of 35 IAC 217.396(c).

d. If there is any deviation of the requirements of this permit, as determined by the records required by this permit or by other means, the Permittee shall promptly report to the Illinois EPA as specified below until such time as the applicable provisions of this permit are addressed in an operating permit. The report shall include a description of the deviation, the probable cause of the deviation, corrective actions taken, and any preventive measures taken.

i. Deviations from the annual limits in Conditions 5 or 6 shall be reported within 30 days.

ii. Other deviations shall be reported in the Semi-Annual Monitoring Report required under the CAAPP permit for the plant, Permit 03080009.

11. Authorization to Operate

a. The Permittee is allowed to operate the affected turbines with oil and during tuning under this construction permit until an operating permit is issued addressing these modes of operation of the affected turbines provided that the testing required by Condition 7(a) and (b) is completed in a timely manner. This condition supersedes Standard Condition 6.

Please note that two storage tanks for fuel oil will also be constructed as part of this project. These tanks are exempt from permitting pursuant to 35 IAC 201.146(n)(3).

If you have any questions on this permit, please contact Bob Smet at 217/785-1705.

Raymond E. Pilapil
Acting Manager, Permit Section

Division of Air Pollution Control

REP:RPS:psj

cc: Lotus Notes
CAAPP Permit File – 03080009