



Connecticut Department of  
**ENERGY &  
ENVIRONMENTAL  
PROTECTION**

**BUREAU OF AIR MANAGEMENT  
NEW SOURCE REVIEW PERMIT  
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

<b>Owner/Operator</b>	Connecticut Municipal Electric Energy Cooperative (CMEEC)
<b>Address</b>	30 Stott Avenue, Norwich, CT 06360
<b>Equipment Location</b>	Alfred L. Pierce Generating Station, 195 East Street, Wallingford, CT 06492
<b>Equipment Description</b>	Power Generation Facility Consisting of a General Electric 7EA Combustion Turbine Generator Set, 84 Megawatts
<b>Town-Permit Numbers</b>	189-0234
<b>Premises Number</b>	114
<b>Stack Number</b>	7
<b>Prior Permit Issue Dates</b>	12/28/06 (Original Permit) 1/15/10 (Minor Modification)
<b>Modification Issue Date</b>	January 30, 2015
<b>Expiration Date</b>	None

/s/ Anne Gobin for \_\_\_\_\_  
Robert J. Klee  
Commissioner

January 30, 2015  
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

## **PART I. DESIGN SPECIFICATIONS**

### **A. General Description**

The Alfred L. Pierce Generating Station (Pierce Station) provides quick-start peaking power for the local electrical grid. Electric power is provided through a combination of existing and new transmission systems. The General Electric 7EA combustion gas turbine generator set is a simple cycle turbine and has a nominal electrical output of 84 Megawatts (MW). The turbine operates with natural gas as its primary fuel and distillate oil as its secondary fuel. The facility has auxiliary systems consisting of turbine lubricating oil, water treatment, a continuous emission monitoring system, electrical transformers, and distillate oil and natural gas distribution systems. Emissions exit a 125 foot painted steel exhaust stack adjacent to the turbine.

The turbine is subject to 40 CFR Part 60 Subpart KKKK (Standards of Performance for Stationary Combustion Turbines) because it has a heat input at peak load greater than 10 MMBTU/hr. The turbine is also subject to the sulfur oxide (SO<sub>x</sub>) and nitrogen oxide (NO<sub>x</sub>) emission limitations in RCOSA §§22a-174-19a, -22, and -22c. The turbine is a Clean Air Interstate Rule (CAIR) NO<sub>x</sub> Ozone season unit and therefore is subject to RCOSA §22a-174-22c.

### **B. Equipment Design Specifications**

1. Turbine
  - a. Maximum Fuel Firing Rates: 1.13 MMft<sup>3</sup>/hr (Natural Gas) at 0°F and 9,061 gal/hr (Distillate Oil) at 0°F
  - b. Maximum Gross Heat Input (MMBTU/hr): 1,153 (Natural Gas) and 1,215 (Distillate Oil)
  - c. Nominal Electrical Output (MW): 84

### **C. Stack Parameters**

1. Minimum Stack Height (ft): 125
2. Minimum Exhaust Gas Flow Rate at 100% load, -5°F (acfm): 1,643,438 (Natural Gas) and 1,677,405 (Distillate Oil)
3. Minimum Stack Exit Temperature at 100% load, -5°F (°F): 951
4. Minimum Distance from Stack to Property Line (ft): 280

## **PART II. OPERATIONAL CONDITIONS**

### **A. Turbine**

1. Fuel Types: Natural Gas and Distillate Oil
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 525 MMft<sup>3</sup> (Natural Gas) and 1340 Mgal (Distillate Oil)
3. Maximum Distillate Fuel Oil Sulfur Content (% by weight, dry basis): 0.0015

4. The turbine may only be fueled by ultra-low sulfur (ULSD) distillate diesel fuel oil when:
  - a. The interruptible natural gas supply to the premises is curtailed;
  - b. There is an unscheduled failure of the equipment required to allow the premises to utilize natural gas;
  - c. The premises is commissioning or testing the oil firing capability of the turbine;
  - d. There is routine maintenance of any equipment required to allow the premises to utilize natural gas or ULSD; or
  - e. As required, periodically maintain an appropriate turnover of the on-site fuel oil inventory as recommended by the fuel storage manufacturer or as otherwise required by good utility practice.
  
5. The Permittee shall make good faith efforts to restrict the operation of the turbine when utilizing ULSD for purposes listed in Part II.A.4 c through e of this permit to only on days when the United States Environmental Protection Agency Air Quality Index rating (AQI Rating) for Connecticut, as reported at [www.ct.gov/deep/aqi](http://www.ct.gov/deep/aqi) is reported to be "Good".
  
6. The Permittee shall immediately institute shutdown of the turbine in the event of a malfunction that results in an exceedance of any permit condition and cannot be corrected within three hours.

### **PART III. ALLOWABLE EMISSION LIMITS**

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time, as determined in accordance with the applicable averaging periods defined in Part IV.A.1 of this permit or as specified in an approved stack test protocol.

An exceedance of either (i) the emission limits in the tables below, or (ii) the emissions limits developed for this permit due to an emergency, malfunction, or cleaning shall not be deemed a "Federally Permitted Release," as that term is used in 42 U.S.C. 9601(10).

*Startup* shall be defined as that period of time from initiation of combustion firing until the unit reaches steady state operation.

*Shutdown* shall be defined as that period of time from the initial lowering of turbine output until the point at which the combustion process has stopped.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance, careless operation, or any other preventable upset condition or careless operation are not malfunctions. [RCSA §22a-174-1(58) and 40 CFR §60.2]

*Emergency* shall be defined as any situation arising from sudden and reasonably unforeseeable events beyond the control of this source, including acts of God, which would require immediate corrective action to restore normal operation, and that causes the source to exceed a technology based limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operations, operator error or decision to keep operating despite knowledge of these things.

**A. Steady State (50-100% Load)**

1. Criteria Pollutants

a. Natural Gas

Pollutant	lb/hr	ppmvd @ 15% O <sub>2</sub>
PM/PM <sub>10</sub> *	10.20	
SO <sub>2</sub>	1.98	
NO <sub>x</sub>	38.75	9
VOC	2.24	
CO	64.24	

b. Distillate Oil

Pollutant	lb/hr	ppmvd @ 15% O <sub>2</sub>
PM/PM <sub>10</sub> *	20.73	
SO <sub>2</sub>	1.91	
NO <sub>x</sub>	206.30	42
VOC	2.28	
CO	52.87	

\* Filterable plus condensable

**B. Transient Operation**

1. Startup and Shutdown Events

	Natural Gas	Distillate Oil
Maximum Duration of Event (min/event)	180	180
NO <sub>x</sub> (lb/event)	150	650
CO (lb/event)	300	300

2. Maintenance and Fuel Switching Events

a. Maintenance and fuel switching events which exceed the emission limits in Part III.A.1 shall not exceed 30 hours per calendar year combined.

b.

	Natural Gas	Distillate Oil
NO <sub>x</sub> (lb/event)	400	1730
CO (lb/event)	800	800

C. The Permittee shall not emit greater than 0.15 pounds of NO<sub>x</sub> per MMBTU average during the period from October 1 to April 30, inclusive. [RCSA §22a-174-22(e)(3)]

#### D. Annual Emission Limits

##### 1. Criteria Pollutants

Pollutant	Tons per 12 Consecutive Month Period
PM/PM <sub>10</sub> *	2.70
SO <sub>2</sub>	0.45
NO <sub>x</sub>	14.90
VOC	0.49
CO	14.90
Pb	0.003

\* Filterable plus condensable

#### E. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA §22a-174-29. [STATE ONLY REQUIREMENT]

#### F. Opacity

This equipment shall not exceed 20% opacity during any six minute block average as measured by 40 CFR Part 60, Appendix A, Reference Method 9. [RCSA §22a-174-18(b)(1)(A)]

#### G. Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using emission factors from the following sources:

- Criteria Pollutants: Manufacturer's Data
- SO<sub>x</sub>: Material Balance
- NO<sub>x</sub> and CO: CEMS Data

#### H. The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

### PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

#### A. Monitoring

1. The Permittee shall comply with the Continuous Emissions Monitoring System (CEMS) requirements as set forth in RCSA §§ 22a-174-4 and 22, 40 CFR Part 60 Subpart KKKK and 40 CFR Parts 72-78, if applicable. CEMS shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Times	Emission Limit
NO <sub>x</sub>	4 hour rolling	9 ppmvd @15% O <sub>2</sub> (Natural Gas) 42 ppmvd @15% O <sub>2</sub> (Distillate Oil)
CO	1 hour block	64.24 lb/hr (Natural Gas) 52.87 lb/hr (Distillate Oil)
O <sub>2</sub>	1 hour block	None <sup>1</sup>

Note 1: Monitoring is required solely to provide basis for correction of actual exhaust gas conditions to dry conditions @15% by volume.

2. The Permittee shall use individual non-resettable totalizing fuel metering devices or billing meters to continuously monitor fuel feed to the turbine.

## **B. Record Keeping**

1. The Permittee shall make and keep records of monthly and consecutive 12 month fuel consumption (for each fuel). The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
2. The Permittee shall make and keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.
3. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC, and CO emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

Emissions during startup, shutdown, maintenance and fuel switching shall be counted towards the annual emission limitation in Part III.D.1 of this permit.

4. The Permittee shall make and keep records of all exceedances of any emissions limitation or operating parameter. Such records shall include:
  - a. the date and time of the exceedance;
  - b. a detailed description of the exceedance; and
  - c. the duration of the exceedance.
5. The Permittee shall make and keep records of the occurrence and duration of any startup, shutdown, maintenance or malfunction in the operation of the stationary gas turbine; or any periods during which a continuous monitoring system or monitoring device is inoperative.  
[40 CFR §60.7(b)]

Such records shall contain the following information:

- a. type of event (startup, shutdown, maintenance, or malfunction);
  - b. date of event;
  - c. duration of event (hours);
  - d. fuel being used during event; and
  - e. total NO<sub>x</sub> and CO emissions emitted (lb) during the event.
6. The Permittee shall make and keep records of the occurrence and duration of any fuel switch in the operation of the stationary gas turbine. Such records shall include the information listed in Parts IV.B.5 b-e of this permit.

7. The Permittee shall make and keep records of the number of hours in which a maintenance or fuel switching event exceeds the emissions limits in Part III.A.1 of this permit. The total number of hours per calendar year shall be calculated within 30 days of the end of each month.
8. The Permittee shall make and keep records of all tune-ups, repairs, replacement of parts and other maintenance. [RCSA §§22a-174-4(d)(1) and -22(l)(1)(D)]
9. The Permittee shall make and keep copies of all documents submitted to the Commissioner. [RCSA §§22a-174-4(d)(1) and -22(l)(1)(E)]
10. The Permittee shall make and keep all charts, electronically stored data and printed records produced by the CEMS. [RCSA §§22a-174-4(d)(1) and -22(l)(1)(F)]
11. The Permittee shall make and keep records of procedures for calculating NO<sub>x</sub> emission rates. [RCSA §22a-174-22(l)(1)(G)]
12. The Permittee shall make and keep CEMS records of all performance evaluations, calibration checks and adjustments on such monitor, maintenance procedures and all data necessary to complete the quarterly reports as required under RCSA §22a-174-22(l)(4). [RCSA §§22a-174-4(d)(1) and -22(l)(1)(I)]
13. The Permittee shall make and keep a log and record the following information:
  - a. Date and hours of operation using distillate fuel oil;
  - b. Reason for operating on distillate fuel as listed in Part II.A.4 of this permit; and
  - c. Good faith efforts taken when using distillate fuel oil as described in Part II.A.5 of this permit.
14. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request. [RCSA §§22a-174-4(d)(3) and -22(l)(5)]

**C. Reporting**

1. The Permittee shall notify the commissioner in writing of any exceedance of an emissions limitation or operating parameter, and shall identify the cause or likely cause of such exceedance, all corrective actions and preventive measures taken with respect thereto, and the dates of such actions and measures as follows:
  - a. For any hazardous air pollutant, no later than 24 hours after such exceedance commenced; and
  - b. For any other regulated air pollutant or operating parameter, no later than ten days after such exceedance commenced.
2. The Permittee shall notify the commissioner in writing of any malfunction of the stationary gas turbine or the continuous monitoring system. The Permittee shall submit such notification within ten days of the malfunction. The notification shall include the following: [RCSA §22a-174-7(d)]
  - a. a description of the malfunction and a description of the circumstances surrounding the cause or likely cause of such malfunction; and
  - b. a description of all corrective actions and preventive measures taken and/or planned with respect to such malfunction and the dates of such actions and measures.

3. The Permittee shall certify in writing to the commissioner that the turbine is in compliance with the applicable provisions of RCSA §22a-174-19a. Such certification shall include actual quarterly SO<sub>2</sub> emissions in tons and either average quarterly fuel sulfur content or average quarterly emission rate, whichever is applicable, for each affected unit.  
[RCSA §22a-174-19a(j)(1)]
4. The Permittee shall submit a written report of the results of the CEMS certification tests to the commissioner within 60 days of the completion of the tests. [RCSA §22a-174-22(l)(3)]
5. The Permittee shall submit to the commissioner written quarterly reports of excess emissions and CEM malfunctions in accordance with RCSA §22a-174-22(l)(4).

#### **PART V. OPERATION AND MAINTENANCE REQUIREMENTS**

- A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.
- B. The Permittee shall operate and maintain this equipment, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
- C. The Permittee shall properly operate the control equipment at all times that this equipment is in operation and emitting air pollutants.

#### **PART VI. SPECIAL REQUIREMENTS**

- A. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60 Subpart KKKK Standards of Performance for Stationary Combustion Turbines and 40 CFR Part 60, Subpart A General Provisions

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

- B. The Permittee shall comply with all applicable requirements of the Federal Acid Rain Program codified in Title 40 CFR Parts 72-78, inclusive, by the deadlines set forth within the aforementioned regulation.
- C. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA §§22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

#### **PART VII. ADDITIONAL TERMS AND CONDITIONS**

- A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

- B.** Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C.** This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D.** This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.
- E.** Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."
- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H.** The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I.** Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.