



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).

Owner/Operator	Bridgeport Energy, LLC
Address	10 Atlantic Street, Bridgeport, CT 06604
Equipment Location	10 Atlantic Street, Bridgeport, CT 06604
Equipment Description	Siemens V84.3A Turbine (190 MW) with unfired Vogt-NEM Heat Recovery Steam Generator
Town-Permit Numbers	015-0191
Premises Number	0862
Stack Number	6
Collateral Condition	This permit contains collateral conditions for Permit No. 015-0190
Prior Permit Issue Date	May 7, 1998 (Permit to Construct) May 28, 1999 (Permit to Operate) July 11, 2012 (Minor Modification) February 1, 2013 (Revision) March 15, 2013 (Minor Modification) May 18, 2018 (Minor Modification)
Revision Issue Date	August 7, 2018
Expiration Date	None

/s/Robert E. Kaliszewski
Robert E. Kaliszewski
Deputy Commissioner

August 7, 2018
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

Bridgeport Energy, LLC is a combined cycle electric generating plant providing power to the bulk power system. This facility consists of two Siemens V84.3A combustion turbines with unfired Vogt-NEM heat recovery steam generators, two combustion turbine generators, and a steam turbine generator with a combined nominal rated capacity of 560 MW.

B. Equipment Design Specifications

1. Maximum Fuel Firing Rate: 2,100,000 ft³/hr
2. Maximum Gross Heat Input: 2,100 MMBtu/hr

C. Control Equipment Design Specifications

1. Low NO_x Burner
 - a. Make and Model: Siemens HR3B
2. Selective Catalytic Reduction (SCR)
 - a. Make and Model: Siemens SINOX
 - b. Catalyst Type: SW 40 D stainless steel honeycomb
3. Oxidation Catalyst
 - a. Make and Model: BASF Camet
 - b. Catalyst Type: 75% corrugated stainless steel foil substrate coated with alumina

D. Stack Parameters

1. Minimum Stack Height: 130 ft
2. Minimum Exhaust Gas Flow Rate at 100% load: 961,440 acfm @ 100% load
3. Minimum Stack Exit Temperature at 100% load: 193°F
4. Minimum Distance from Stack to Nearest Property Line: 100 ft

PART II. OPERATIONAL CONDITIONS

A. Equipment Operational Conditions

1. Fuel Type: Natural Gas
2. Sulfur content of the fuel: 0.5 grains of sulfur or less/100 scf
3. Maximum Fuel Consumption over any Consecutive 12 Month Period:
33,109,900,000 standard ft³ (scf) combined total for Permit Nos. 015-0190 and 015-0191

4. The Permittee shall minimize emissions during periods of startup and shutdown by starting the ammonia injection as soon as minimum catalyst temperature is reached.
5. The oxidation catalyst shall not be bypassed during startup or shutdown.
6. Startup shall be defined as that period of time from initiation of combustion firing until the end of 180 minutes.
7. Shutdown shall be defined as that period of time from the initiation of the shutdown process of the combustion turbine until the point at which the combustion process stopped.
8. Neither startup, shutdown, nor equipment tuning events shall exceed 180 minutes each.

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 of this permit or as specified in an approved stack test protocol.

An exceedance of either:

- (1) the emission limits in the tables below, or
- (2) the emissions limits developed for this permit due to startup, shutdown and equipment tuning shall not be deemed a "Federally Permitted Release," as that term is used in 42 U.S.C. 9601(10).

A. Steady State (Operations following startup until commencement of shutdown)

1. Criteria Pollutant Emission Limits

a. Turbine Inlet Temperatures 59°F and above

Criteria Pollutants	ppmvd @ 15% O ₂	ppmvw @ 15% O ₂	lb/hr	lb/MMBtu
PM ₁₀ /PM _{2.5}			17.5	0.0090
SO _x			1.17	0.0006
NO _x	6		41.3	0.021
VOC		3	7.0	0.0036
CO	10		42.0	0.022

b. Turbine Inlet Temperatures below 59°F

Criteria Pollutants	ppmvd @ 15% O ₂	ppmvw @ 15% O ₂	lb/hr	lb/MMBtu
PM ₁₀ /PM _{2.5}			17.5	0.0083
SO _x			1.26	0.0006
NO _x	6		41.3	0.020
VOC		3	7.0	0.0033
CO	10		42.0	0.020

2. Hazardous Air Pollutant Emission Limits

- a. Ammonia: 6.3 ppmvw @15% O₂
- b. This unit shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA section 22a-174-29. [State-Only Requirement]

3. **Opacity:** This unit shall not exceed 10% during any six minute block average as measured by 40 CFR Part 60, Appendix A, Reference Method 9.

B. Startup, Shutdown and Equipment Tuning

1. NO_x startup, shutdown and equipment tuning limit: 500 lb/event
2. CO startup, shutdown and equipment tuning limit: 4,000 lb/event
3. Emissions during these periods shall be counted towards the total allowable emission limits stated herein.

C. Total Allowable Emissions

Total allowable emissions are the combined total emissions, including emissions from startup, shutdown and equipment tuning, for Permit Nos. 015-0190 and 015-0191.

Criteria Pollutants	TPY
PM ₁₀ /PM _{2.5}	138
SO _x	9.9
NO _x	362.9
VOC	61.5
CO	339.4
GHG	2,188,572

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

1. PM₁₀, PM_{2.5}, VOC, Ammonia: Latest stack test data
2. NO_x, CO: CEM data
3. SO_x: 0.0006 lb/MMBtu [40 CFR Part 75 Appendix D, Section 2.3.1.1].
4. GHG: 40 CFR Part 98 Subpart D

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 CEM requirements as set forth in RCSA Section 22a-174-4, RCSA Section 22a-174-22, 40 CFR Part 60 Subpart KKKK and 40 CFR Parts 72-78, if applicable. CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Periods	Units
O ₂	1 hour block	%vd
Steady State		
NO _x	24 hour rolling	ppmvd
CO	1 hour block	ppmvd

The Permittee shall operate two CO analyzers: a low range (0-20 ppm) and a high range (0-3500 ppm).

2. The Permittee shall use a fuel metering device to continuously monitor fuel feed to each turbine (Permit Nos. 015-0190 and 015-0191).
3. The Permittee shall continuously monitor the SCR aqueous ammonia injection rate (gal/hr), operating temperature (°F) and pressure drop (inches of water) across the catalyst bed. The Permittee shall maintain these parameters within the ranges recommended by the manufacturer to achieve compliance with the emission limits in this permit.
4. The Permittee shall continuously monitor the oxidation catalyst inlet temperature (°F). The Permittee shall maintain this parameter within the ranges recommended by the manufacturer to achieve compliance with the emission limits in this permit.
5. The Permittee shall continuously monitor the turbine inlet temperature (°F) and use the average of the two turbines (Permit Nos. 015-0190 and 015-0191) inlet (pre-filter) air temperatures to determine applicable allowable emissions.

B. Record Keeping

1. The Permittee shall continuously record the SCR aqueous ammonia injection rate (gal/hr), operating temperature (°F) and pressure drop (inches of water) across the catalyst bed.
2. The Permittee shall continuously record the oxidation catalyst inlet temperature (°F).
3. The Permittee shall keep records of the monthly and consecutive 12 month natural gas usage for this turbine and both turbines (Permit Nos. 015-0190 and 015-0191) combined. The consecutive 12 month fuel usage shall be determined by adding the current month's fuel usage to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
4. The Permittee shall keep records of the fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying the maximum total sulfur content for the natural gas to show compliance with the limit in Part II of this permit.
5. The Permittee shall calculate and record, for this turbine and both turbines (Permit Nos. 015-0190 and 015-0191) combined, monthly and consecutive 12 month PM₁₀, PM_{2.5}, SO₂, NO_x, CO and VOC 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 and equipment tuning shall be counted towards the annual emission limitation in Part III.C of this permit.

6. The Permittee shall keep all charts, electronically stored data, and printed records produced by the CEM equipment.
7. The Permittee shall make and keep records of all performance evaluations, calibration checks and adjustments of the CEM equipment and a record of maintenance procedures.
8. The Permittee shall record all deviations of any emission limitation or operating parameter. Such records shall include:
 - a. the date and time of the deviation,
 - b. a detailed description of the deviation, and
 - c. the duration of the deviation.

Note: Deviation is as defined in 40 CFR §71.6(a)(3)(iii)(C).

9. The Permittee shall keep records of the occurrence and duration of any startup, shutdown, equipment tuning or malfunction in the operation of the turbine; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.

Such records shall contain the following information:

- a. type of event (startup, shutdown, equipment tuning or malfunction);
 - b. equipment affected;
 - c. date of event;
 - d. duration of event (minutes); and
 - e. total NO_x and CO emissions emitted (lb) during the event.
10. The Permittee shall keep records of each delivery of aqueous ammonia. The records shall include the date of delivery, the name of the supplier, the quantity of aqueous ammonia delivered, and the percentage of ammonia in solution, by weight.
 11. The Permittee shall keep records of the inspection and maintenance of the SCR and oxidation catalysts. The records shall include the name of the person, the date, the results or actions and the date the catalyst is replaced.
 12. The Permittee shall continuously record the turbine inlet temperature (°F).
 13. The Permittee shall maintain records of stack testing results.
 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.

C. Reporting

1. The Permittee shall notify the commissioner, in writing, of any exceedance from 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 equipment described in this permit. The Permittee shall submit such notification within ten days of the malfunction. The notification shall include the following:
 - 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 submit the above notifications to the Supervisor of the Compliance Analysis & Coordination Unit, Enforcement Section, Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

PART V. STACK EMISSION TEST REQUIREMENTS

- A. Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website.
- B. Recurrent stack testing for VOC, PM₁₀/PM_{2.5} and ammonia shall be conducted within five years from the date of the previous stack test.
- C. The maximum rated capacity of the turbine may be corrected for the ambient temperature at the time of stack testing using Equations 1 and 2 below. Ambient temperature shall be the average of the two turbines (Permit Nos. 015-0190 and 015-0191) inlet (pre-filter) air temperatures at the time of stack testing.

Equation 1: For temperatures greater than or equal to 32°F

$$Y: 2,100 - 5.72 (T-32)$$

Where Y= Heat Input (MMBtu/hr)
T= Ambient Air Temperature (°F)

Equation 2: For temperatures below 32°F

$$Y = 2,100 \text{ MMBtu/hr}$$

Where Y= Heat Input (MMBtu/hr)

- D. NO_x: stack testing shall be done in accordance with the requirements of RCSA §22a-174-22 and 40 CFR Part 60 Subpart KKKK.
- E. Stack test results shall be reported as follows:
 1. PM₁₀ and PM_{2.5} in units of lb/hr and lb/MMBtu.
 2. VOC in units of lb/hr, lb/MMBtu and ppmvw at 15% O₂.
 3. Ammonia in units of µg/m³ and ppmvw at 15% O₂.
- F. The Permittee shall submit test results within 60 days after completion of testing.

PART VI. SPECIAL REQUIREMENTS

- A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations. The Permittee shall operate and maintain this turbine, 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.
- B. The Permittee shall perform inspections of the SCR and oxidation catalysts as recommended by the manufacturer.
- 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 Sections 22a-69-1 through 22a-69-7.4. [State Only Requirement]

- D. The Permittee shall comply with all applicable sections of the following New Source Performance Standard at all times.

Title 40 CFR Part 60 Subparts: A and KKKK

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

- E. Internal Offset Requirements: *The following language is for historical purposes only*

As of the date of permit issuance, May 7, 1998, for two Siemens turbines (Permit Nos. 015-0190 and 015-0191), the internal offset requirements of former RCRA Section 22a-174-3(l) were met by deactivating Bridgeport Harbor Station Unit 1 (Registration No. 015-0160).

Pollutant	Bridgeport Harbor Station Unit 1 (Registration No. 015-0160)	External Offsets Required by Permit Nos. 015-0190 and 015-0191	Internal Offsets Required by Permit Nos. 015-0190 and 015-0191
VOC	13.67	67.0	62.1
NO _x	795.3	0	532.7
CO	63.3	0	0
PM ₁₀	116.4	0	18.24
SO _x	2015.7	0	81.1

- F. 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.

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.