



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	PSEG Power Connecticut LLC – Bridgeport Harbor Station
Address	1 Atlantic Street, Bridgeport, CT 06604
Equipment Location	1 Atlantic Street, Bridgeport, CT 06604
Equipment Description	General Electric 7HA.02 dual fired Combustion Turbine, Duct Burner and Heat Recovery Steam Generator
Town-Permit Numbers	015-0299
Premises Number	045
Stack Number	17
Collateral Conditions	Part III.H: Green House Gases Emission Limitations for the Unit 5 Combined Cycle Project Part VII: Collateral Conditions for the Emergency Fire Pump Engine (EU-53), Cooling Tower (EU-54) and HVAC/space heaters (GEU-1) Part VIII: Collateral Conditions for NOx and VOC Offsets
Prior Permit Issue Date	April 11, 2017 March 27, 2018 (Minor Modification)
Permit Issue Date	June 14, 2018
Expiration Date	None

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

June 14, 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

PSEG Power Connecticut, LLC (PSEG) is an exempt wholesale electric generating facility with its principal place of business in Newark, New Jersey. Bridgeport Harbor Station (BHS) has been in operation as an electrical generation station since 1957.

PSEG's Unit 5 Combined Cycle Project includes the following equipment:

1. One dual-fuel-fired General Electric (GE) Model 7HA.02 combustion turbine with duct burner operating under Permit No. 015-0299;
2. One auxiliary boiler operating under Permit No. 015-0300;
3. One emergency generator operating under Permit No. 015-0301;
4. One emergency fire pump operating under collateral conditions in Part VII.A of Permit No. 015-0299;
5. One - three cell auxiliary evaporative cooling tower operating under collateral conditions in Part VII.B in Permit No. 015-0299;
6. Fuel oil tanks; and
7. Natural gas fired heating, ventilation, air conditioning (HVAC) units, make up air heaters and building space heaters (HVAC/space heaters) operating under collateral conditions in Part VII.C of Permit No. 015-0299.

The combined cycle unit would be constructed on a 1x1 configuration; that is, a single combustion turbine generator (CTG) exhausting to a single supplementary fired Heat Recovery Steam Generator (HRSG). Steam generated in the HRSG will drive a single steam turbine generator (STG).

B. Equipment Design Specifications

1. Turbine
 - a. Natural Gas:
 - i. Maximum Natural Gas Firing Rate: 3.227 MMscf/hr
 - ii. Maximum Gross Heat Input: 3,292 MMBtu/hr
 - b. Ultra Low Sulfur Distillate (ULSD):
 - i. Maximum ULSD Firing Rate: 24,913 gal/hr
 - ii. Maximum Annual Fuel Usage: 16.7 MMgal
 - iii. Maximum Gross Heat Input: 3,439 MMBtu/hr
2. Duct Burner (Natural Gas)
 - a. Maximum Fuel Firing Rate: 0.262 MMscf/hr
 - b. Maximum Gross Heat Input: 267 MMBTU/hr

C. Control Equipment Design Specifications

1. Water Injection for the Turbine (ULSD Operation)
2. Dry Low NO_x Burners (Natural Gas Operation)
3. Selective Catalytic Reduction (SCR)
 - a. Make and Model: EnviroKinetics or equivalent
 - b. Catalyst Type: Titanium-Vanadium-Tungsten or equivalent
 - c. Collection Efficiency: 100%
 - d. Control Efficiency: 90%
 - e. Overall Control Efficiency: 90%
 - f. Pollutant Controlled: NO_x
4. Oxidation Catalyst
 - a. Make and Model: EmeraChem or equivalent
 - b. Catalyst Type: Metal Honeycomb or equivalent
 - c. Collection Efficiency: 100%
 - d. Control Efficiency: 90%
 - e. Overall Control Efficiency: 90%
 - f. Pollutants Controlled: CO, VOC

D. Stack Parameters

1. Minimum Stack Height (above grade): 300 ft
2. Minimum Exhaust Gas Flow Rate at 100% load: 980,000 acfm
3. Minimum Stack Exit Temperature at 100% load: 170 °F
4. Minimum Distance from Stack to Property Line: 199 ft

E. Definitions

1. "Steady-state" operation shall be defined as operation of the turbine during all operating periods other than transient operation.
2. "Transient" operation shall be defined as operation of the combustion turbine during periods of startup, shutdown, fuel switching and equipment cleaning with turbine load less than the manufacturer's specified minimum operating load.
3. "Minimum Operating Load" shall be defined as the lowest value that the combustion turbine can operate while the Steady State emissions limits in Part III.A of this permit are being met at the HRSG stack exit.
4. "Malfunction" shall be defined as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment or a process to operate in accordance with the allowable limits in Part III.A of this permit. Failures that were caused in part by poor maintenance or careless operation are not malfunctions.

5. "Shakedown" shall be defined as turbine operations including, but not limited to, the first firing of the turbine, proof of interlocks, steam blowing, chemical cleaning and initial turbine roll. The shakedown period shall not extend beyond the required date for the initial performance tests.
6. "Commencement of commercial operation" shall mean to have begun to produce steam, gas or other heated medium used to generate electricity for sale or use.
7. "Oil-fired unit" shall mean the combustion of fuel oil for more than 10.0 percent of the average annual heat input during the previous three calendar years or for more than 15.0 percent of the annual heat input during any one of those calendar years. [40 CFR §72.2]
8. "Hot startup" shall be defined as startup when the turbine has been down for less than 8 hours.
9. "Warm startup" shall be defined as startup when the turbine has been down for more than 8 hours.
10. "Cold startup" shall be defined as startup when the turbine has been down for more than 24 hours.

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. Turbine
 - a. Fuel Types: Natural Gas, ULSD
 - b. Maximum Heat Input over any Consecutive 12 Month Period:
 - i. Natural Gas: 25,885,944 MMBtu (HHV)
 - ii. ULSD: 2,309,684 MMBtu (HHV)
 - c. Maximum ULSD Sulfur Content: 0.0015 % by weight
 - d. Maximum Natural Gas Sulfur Content: 0.5 grains/100 scf
 - e. The Permittee shall only burn ULSD in the combined cycle turbine during hours when one or more of the conditions in subparagraphs (i) – (viii) below is true:
 - i. Independent System Operator – New England (ISONE) declares an Energy Emergency as defined in ISONE's Operating Procedure No. 21 – Energy Inventory Accounting and Actions during an Energy Emergency and requests the firing of ULSD.
 - ii. ISO-NE required audits of capacity.
 - iii. The natural gas supply is curtailed by the gas supplier. A curtailment begins when the Permittee receives a communication from the gas supplier stating that natural gas supply will be curtailed, and ends when the Permittee receives a communication from the gas supplier stating that the curtailment has ended.

- iv. There exists a physical blockage or breakage in the natural gas pipeline.
- v. The Permittee is commissioning the combined cycle turbine and, pursuant to the turbine manufacturer's written instructions, the Permittee is required by the manufacturer to fire ULSD during the commissioning process.
- vi. The firing of ULSD is required for emission testing purposes as specified in Part V of this permit.
- vii. Routine maintenance of any equipment that will require the Permittee to fire ULSD.
- viii. In order to maintain an appropriate turnover of the on-site fuel oil inventory, the Permittee may fire ULSD when the last delivery of the oil to the tank was more than six months ago.
- ix. The Permittee will be allowed to operate the duct burner on natural gas during ULSD operation of the turbine for up to 250 hours in a 12 consecutive month period.

2. Duct Burner

- a. Fuel Type: Natural Gas
- b. Maximum Heat Input over any Consecutive 12 Month Period: 849,934 MMBtu (HHV)

- B.** The Permittee shall operate and maintain the turbine, duct burner, air pollution control equipment and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including startup and shutdown.
- C.** The Permittee shall operate and maintain the turbine, duct burner, air pollution control equipment in accordance with the most recent specific and written recommendations supplied by the equipment manufacturer.
- D.** The Permittee shall immediately institute shutdown of the turbine in the event where emissions are in excess of a limit of Part III of this permit that cannot be corrected within three hours of when the emission exceedance was identified.
- E.** No period of Transient operation shall exceed 60 consecutive minutes.
- F.** The Permittee shall minimize emissions during periods of startup and shutdown by the following work practices and time constraints:
 - 1. Start the ammonia injection as soon as minimum catalyst temperature is reached;
 - 2. The oxidation catalyst shall not be bypassed during startup or shutdown; and
 - 3. Emissions during these periods shall be counted towards the annual emission limits stated herein.
- G.** The Permittee shall not exceed a total of 500 hours of cold startups, warm startups, hot startups and shutdown per calendar year.
- H.** The Permittee shall not exceed a maximum allowable rate of 6,612 Btu/kW-hr (HHV, net plant), corrected to ISO conditions, during the initial performance test while firing natural gas in the combustion turbine without duct firing.

PART III. ALLOWABLE EMISSION LIMITS

Except during the initial shakedown period, the Permittee shall not cause or allow the turbine and duct burner to exceed the emission limits stated herein at any time during steady state operation.

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).

A. Steady State Emission Limits

These short term emission limits do not apply during periods of startup and shutdown, unless otherwise noted.

Compliance with VOC emission limits in the tables below shall be determined by correlating the VOC emissions to the CO emissions using the results of the stack test required in Part V of this permit along with manufacturer's data and tracked using the CO CEMS.

1. Turbine operating on natural gas without duct firing (Mode 1)

Pollutant	lb/hr	ppmvd @ 15% O ₂	lb/MMBtu ¹
PM/ PM ₁₀ / PM _{2.5}	11.9		0.007
SO ₂	5.5		0.002
NO _x	25.1	2.0	
CO	6.9	0.9	
VOC	3.1	0.7	
Lead	0.0016		
Sulfuric Acid	3.6		
Ammonia		2.0	

2. Turbine operating on natural gas with duct firing natural gas (Mode 2)

Pollutant	lb/hr	ppmvd @ 15% O ₂	lb/MMBtu ¹
PM/ PM ₁₀ / PM _{2.5}	14.6		0.005
SO ₂	5.6		0.002
NO _x	25.7	2.0	
CO	13.3	1.7	
VOC	7.2	1.6	
Lead	0.0017		
Sulfuric Acid	3.6		
Ammonia		2.0	

3. Turbine operating on ULSD without duct firing (Mode 3)

Pollutant	lb/hr	ppmvd @ 15% O ₂	lb/MMBtu ¹
PM/PM ₁₀ / PM _{2.5}	60.0		0.030
SO ₂	6.6		0.002
NO _x	56.1	4.0	
CO	17.1	2.0	
VOC	9.8	2.0	
Lead	0.05		
Sulfuric Acid	4.3		
Ammonia		5.0	

4. Turbine operating on ULSD with duct burner operating on natural gas (Mode 4)

Pollutant	lb/hr	ppmvd @ 15% O ₂	lb/MMBtu ¹
PM/ PM ₁₀ / PM _{2.5}	65.0		0.021
SO ₂	7.1		0.002
NO _x	60.2	4.0	
CO	55.0	6.0	
VOC	20.9	4.0	
Lead	0.05		
Sulfuric Acid	4.6		
Ammonia		5.0	

¹ lb/MMBtu allowable emission limits shall apply at all times, including periods of startup and shutdown.

B. Transient Operation Emissions Rate

Except during the initial shakedown period, the Permittee shall not cause or allow this equipment to exceed these limits during startup and shutdown events.

1. Cold Startup/Shutdown

	Startup		Shutdown	
	Natural Gas	ULSD	Natural Gas	ULSD
NO _x (lb/event)	99	108	9.8	16
VOC (lb/event)	10.2	31	26	6.2
CO (lb/event)	129	284	124	42.0
Ammonia (NH ₃) (ppmvd@15% O ₂)	5.0	5.0	5.0	5.0

2. Warm Startup/Shutdown

	Startup		Shutdown	
	Natural Gas	ULSD	Natural Gas	ULSD
NO _x (lb/event)	99	108	9.8	16
VOC (lb/event)	9.6	31	26	6.2
CO (lb/event)	126	279	124	42.0
Ammonia (NH ₃) (ppmvd@15% O ₂)	5.0	5.0	5.0	5.0

3. Hot Startup/Shutdown

	Startup		Shutdown	
	Natural Gas	ULSD	Natural Gas	ULSD
NO _x (lb/event)	67	63	9.8	16
VOC (lb/event)	8.4	28	26	6.2
CO (lb/event)	120	261	124	42.0
Ammonia (NH ₃) (ppmvd@15% O ₂)	5.0	5.0	5.0	5.0

C. Total Allowable Emission Limits

The Permittee shall not cause or allow the General Electric 7HA.02 dual fired combustion turbine; duct burner; heat recovery steam generator; and HVAC units, makeup air heaters and building space heaters (GEU-1) to exceed the emission limits stated herein at any time.

Pollutant	Tons per 12 consecutive months
PM/ PM ₁₀ / PM _{2.5}	71.8
SO ₂	22.7
NO _x	126.8
VOC	29.5
CO	95.1
Lead	0.02
Sulfuric Acid	14.6
Ammonia	47.6

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

E. Opacity:

1. This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR Part 60, Appendix A, Reference Method 9.
2. A certified observer shall conduct visual observations once every 100 hours of oil firing operation using Reference Method 9. Monitoring and record keeping may occur at a lesser frequency if circumstances prohibit conducting a visual determination (e.g. night time operation, weather conditions, unplanned dispatching, etc.) within the 100 hour timeframe. However, in no case shall the interval between visual determinations exceed 125 hours of oil firing operation. If the visual observation occurs at a lesser frequency than every 100 hours of oil firing operation, the reason for monitoring at a lesser frequency shall also be recorded. Installation and operation of a Continuous Opacity Monitor (COM) on the turbine will be required in accordance with 40 CFR §75.10(a)(4) in the event ULSD use causes the turbine to be defined as an "oil-fired unit."

F. Demonstration of compliance with the above emission limits may be met by calculating the emission rates using the most recent approved stack test results for that pollutant, or if unavailable, emission factors from the following sources:

1. PM/PM₁₀/PM_{2.5}, VOC, H₂SO₄: stack testing data
2. SO₂: Sulfur content in fuel

3. NO_x, Ammonia & CO (steady state): CEM data
4. NO_x, VOC, Ammonia & CO (transient): Manufacturer's recommended uncontrolled emission factors
5. HAP: AP-42, Fifth Edition, Volume I Chapter 3.1, April 2000 except for those HAP with required stack test found in Part V of this permit.

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.

G. Initial Shakedown Period

1. The Permittee is not required to demonstrate compliance with the short-term emission limits stated herein during the initial shakedown period.
2. Emissions during the initial shakedown period shall be counted towards the annual emission limits stated herein.
3. The shakedown period shall not extend beyond the required date for the initial performance tests.

H. Greenhouse Gas Emissions for the Unit 5 Combined Cycle Project

The Permittee shall not cause or allow the equipment associated with the Unit 5 Combined Cycle Project to exceed the emission limits stated herein:

1. The Permittee shall not exceed a maximum allowable CO₂ for the combined cycle unit of 926 lb/MWh (net plant) on a consecutive 12 month operating rolling basis for the turbine and its associated duct burner including MWh from ULSD firing and the steam turbine.
2. CO₂ from the HRSG stack shall be monitored by a CEM system.
3. The following calculation method shall be used:
 - a. Determine total hourly CO₂ mass emission (lbs) for each hour of the operating month using CO₂ CEMs.
 - b. Determine total hourly net electrical output in terms of MWh for each hour of the operating month.
 - c. Sum the hourly CO₂ mass emissions calculated for the month.
 - d. Sum the total net output calculated for the operating month.
 - e. Divide the total CO₂ mass emissions calculated for the month by the total net output calculated for the operating month.
 - f. Add the quotient to the sum of the quotient of the previous 11 operating month and divide by 12 to determine the consecutive 12 month total (rolling 1 month basis).
4. The Permittee shall not exceed a combined CO_{2e} emission limit of 1,671,463 TPY for the Unit 5 Combined Cycle Project. Compliance with this limitation shall be determined on a 12 month rolling basis and allocated according to the following table:

	Combustion turbine/duct burner	HVAC/Space Heaters	Auxiliary Boiler	Emergency Generator	Emergency Fire Pump Engine	Fugitive Emissions	Unit 5 Combined Cycle Project
	Permit No. 015-0299	Collateral Conditions in Permit No. 015-0299	Permit No. 015-0300	Permit No. 015-0301	Collateral Conditions in Permit Nos. 015-0299	SF ₆ – Circuit breakers CH ₄ – natural gas pipeline and associated components	
CO _{2e}	-----	117 lb/MMBtu	117 lb/MMBtu	163 lb/MMBtu	163 lb/MMBtu	----- -	-----
	1,620,616 TPY -----		41,031 TPY	468 TPY	63 TPY	9,285TPY	1,671,463 TPY

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

- a. CO₂ emissions from the combustion turbine shall be determined by CO₂ CEM.
- b. CO₂ emissions from the auxiliary boiler, emergency generator, emergency fire pump engine and HVAC/space heaters shall be determined using the default emission factors from 40 CFR Part 98 Subpart C - General Stationary Fuel Combustion Sources, Table C-1: Default CO₂ Emission Factors and High Heat Values for Various Types of Fuel.
- c. Methane (CH₄) and Nitrous Oxide (N₂O) for all combustion sources shall be determined using the default emission factors found in 40 CFR Part 98 Subpart C - General Stationary Fuel Combustion Sources; Table C-2: Default CH₄ and N₂O Emission Factors for Various Types of Fuel.
- d. Emissions of SF₆ from the electrical circuit breakers shall be determined using mass balance found in 40 CFR Part 98 Subpart DD - Electrical Transmission and Distribution Equipment; Equation DD-1.
- e. Emissions from CH₄ from the natural gas pipeline and associated components shall be determined using the default emission factors found in 40 CFR Part 98 Subpart W Petroleum and Natural Gas System; Table W-7: Default Methane Emission Factors for Natural Gas Distribution.
- f. Global Warming Potential used for all sources shall be those found in 40 CFR Part 98 Subpart A – Global Warming Potentials (100 year Time Horizon).

I. 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 §§22a-174-4 and 22a-174-22e, 40 CFR Part 60 Subpart KKKK and 40 CFR Parts 72-78, as applicable. CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

Pollutant/Operational Parameter	Averaging Times	Emission Limit
CO ₂	1 hour block	See Part III.H Allowable Emissions Limits
NO _x	1 hour block	See Part III.A Allowable Emissions Limits
CO	1 hour block	See Part III.A Allowable Emissions Limits
NH ₃	1 hour block	See Part III.A Allowable Emissions Limits
O ₂	1 hour block	
Fuel Flow	1 hour block	
Net Electrical Output	Continuous	

2. At least 60 days prior to the initial stack test, the Permittee shall submit a CEM monitoring plan to the commissioner in accordance with RCSA §22a-174-4(c)(3).
3. The Permittee shall use fuel flow meters, certified in accordance with 40 CFR Part 75 Appendix D to measure and record the fuel rate to the turbine and duct burner.
4. The Permittee shall continuously monitor and continuously record the water injection rate (lb/hr). The Permittee shall maintain this parameter within the range recommended by the manufacturer to achieve compliance with the emission limits in this permit.
5. The Permittee shall perform inspections of the SCR and oxidation catalysts as recommended by the manufacturer.
6. Prior to operation, the Permittee shall develop a written plan for the operation, inspection, maintenance, preventive and corrective measures for minimizing GHG emissions (CH₄ from the natural gas pipeline components and SF₆ emissions from the insulated electrical equipment). At a minimum the plan shall provide for:
 - a. Implementation of daily auditory/visual/olfactory inspections of the natural gas piping components supplying natural gas to the combustion turbine/duct burner;
 - b. An installed leak detection system to include audible alarms to identify SF₆ leakage from the circuit breakers;
 - c. Inspection for SF₆ emissions from the insulated electrical equipment on at least a monthly basis.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption for the turbine. 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 keep records of monthly and consecutive 12 month natural gas consumption for the duct burner. The consecutive 12 month natural gas consumption shall be determined by adding the current month's natural gas consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
3. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the turbine for both natural gas and ULSD firing. The records shall include sample calculations.
4. The Permittee shall 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.
5. 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 or periodic fuel sampling as allowed under 40 CFR §60.4370(c) to show compliance with the limit in Part II of this permit.
6. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the duct burner. The record shall include sample calculations.
7. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, PM_{2.5}, SO₂, NO_x, VOC, CO, H₂SO₄, NH₃ and CO_{2e} 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 and shutdown shall be counted towards the annual emission limitation in Part III.C of this permit.

8. The Permittee shall keep records of the emissions of the turbine/duct burner during the initial shakedown period. Emissions during shakedown shall be calculated using good engineering judgement and the best data and methodology available for estimating such emissions.

Emissions during shakedown shall be counted towards the annual emission limitations in Part III.C of this permit.

9. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, PM_{2.5}, SO₂, NO_x, VOC, CO, H₂SO₄, NH₃ and CO_{2e} emissions in units of tons from the turbine and HVAC/space heaters combined to show compliance with Part III.C of this permit. 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 and shutdown shall be counted towards the annual emission limitation in Part III.C of this permit.

10. The Permittee shall 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.
11. The Permittee shall keep records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the stationary gas turbine/duct burner; any malfunction of the air pollution control equipment; 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, or malfunction)
 - b. if a startup, then what kind (hot, warm, cold);
 - c. equipment affected;
 - d. date of event, start time and end time;
 - e. duration of event (minutes);
 - f. fuel being used during event; and
 - g. total NO_x, CO, ammonia and VOC emissions emitted (lb) during the event.
12. The Permittee shall keep records of each delivery of aqueous ammonia. The records shall include:
 - a. the date of delivery;
 - b. the name of the supplier;
 - c. the quantity of aqueous ammonia delivered; and
 - d. the percentage of ammonia in solution, by weight.
 13. The Permittee shall keep records of the inspection and maintenance of the SCR and oxidation catalysts. The records shall include:
 - a. the name of the person;
 - b. the date;
 - c. the results or actions; and
 - d. the date the catalyst is replaced.
 14. The Permittee shall keep records of all repairs/replacement of parts and other maintenance activities for the equipment.
 15. The Permittee shall keep records of the electrical output of the plant (net).
 16. The Permittee shall keep records of the inspections, maintenance, preventive and corrective measures for minimizing GHG emissions from the natural gas pipeline components and the insulated electrical equipment. The records shall include:

- a. The name of the person conducting the inspection/maintenance;
 - b. The date that the inspection/maintenance was conducted;
 - c. The results and actions taken;
 - d. The leak detection method used; and
 - e. The amount of SF₆ added (if any) to the electrical equipment.
17. The Permittee shall keep monthly records of the audible alarms from the SF₆ leak detection system and inspections for the insulated electrical equipment. The records shall include:
- a. The name of the person conducting inspection/maintenance;
 - b. The date the inspection/maintenance took place; and
 - c. The results or actions taken.
18. The Permittee shall make and keep records of all occurrences of firing ULSD in the turbine. At a minimum these records shall contain the following information:
- a. The date the turbine operated on ULSD;
 - b. The duration of ULSD firing;
 - c. The reason for ULSD firing; and
 - d. The heat input to the turbine.
19. The Permittee shall make and keep records of all occurrences of firing ULSD in the turbine and natural gas in the duct burner. At a minimum these records shall contain the following information:
- a. The date the turbine operated firing ULSD/duct burner operated firing natural gas;
 - b. The duration of the turbine firing ULSD/duct burner firing natural gas occurrence,
 - c. The reason for the turbine firing ULSD/duct burner firing natural gas occurrence; and
 - d. The heat input to the turbine and duct burner.
20. The Permittee shall keep a certified copy of this permit on the premises at all times, and shall make it available upon request of the commissioner for the duration of this permit. This permit shall also be available for public inspection during regular business hours.
21. The Permittee shall keep records of the manufacturer written recommendations for operation and maintenance of the turbine/duct burner and air pollution control equipment.
22. The Permittee shall keep records of stack testing reports.
23. 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 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/duct burner, the air pollution control equipment or the continuous monitoring system. 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 notify the commissioner, in writing, of the date of commencement of construction and commencement of commercial operation of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.
4. 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. Initial stack testing shall be required for the following pollutant(s):

- | | | | |
|---|---|---|--|
| <input checked="" type="checkbox"/> PM/PM ₁₀ /PM _{2.5} | <input checked="" type="checkbox"/> SO ₂ | <input checked="" type="checkbox"/> NO _x | <input checked="" type="checkbox"/> CO |
| <input checked="" type="checkbox"/> VOC | <input checked="" type="checkbox"/> Opacity | <input checked="" type="checkbox"/> CO ₂ | |
| <input checked="" type="checkbox"/> Other (HAPs): Sulfuric Acid, Formaldehyde, Arsenic, Ammonia | | | |

1. Stack emissions testing firing natural gas, without duct firing, for CO₂ shall only be required during the initial performance test to show compliance with an emissions limit of 773 lbs/MW-hr (net plant), corrected to ISO conditions, as defined in the approved stack test protocol.
2. For the purpose of determining maximum heat input of the turbine and including the duct burner as applicable during performance testing, the following equation may be used when the actual ambient temperature is not specified in Table 1:

$$MHI_T: Q_1 - [(T_{Act} - T_1)/(T_2 - T_1)] \times (Q_1 - Q_2)$$

Where:

MHI_T: Turbine or duct burner maximum heat input at ambient temperature (°F)

T_{Act}: Actual ambient temperature

T₁: Temperature value from Table 1 that is below T_{Act}

T₂: Temperature value from Table 1 that is above T_{Act}

Q₁: Maximum Heat Input value from Table 1 at corresponding T₁

Q₂: Maximum Heat Input value from Table 1 at corresponding T₂

Table 1: Maximum Heat Input Capacities at Given Ambient Temperatures for Natural Gas and ULSD

Actual Ambient Temperature (T _{Act})	Natural Gas		ULSD	
	Heat Input (Q) For Combustion Turbine without Duct Burner	Heat Input (Q) for Duct Burner	Heat Input (Q) For Combustion Turbine without Duct Burner	Heat Input (Q) for Duct Burner
0	3,292	73*	3,439	267
20	3,281	84*	3,422	267
35	3,245	120*	3,396	267
50	3,138	227*	3,348	267
59	3,128	237*	3,321	267
80	3,096	267	3,281	267
90	3,043	267	3,199	267
100	2,967	267	3,079	267

Note:

* For natural gas firing, turbine/duct burner reaches a maximum total fuel consumption at 59 °F and is based on a maximum gas availability for the combustion turbine + the duct burner of 3,365 MMBtu/hr HHV. As the ambient temperature decreases below 59 °F, the total maximum heat input remains constant by burning less fuel in the duct burner while the combustion turbine burns more fuel. This is done so that the maximum amount of natural gas available to the site is utilized to produce electricity in the most efficient manner.

Units of measure are MMBtu/hr (HHV) for Heat Input and °F for temperature.

3. The Permittee shall perform one set of tests on this turbine for the following scenarios:
 - a. Mode 1: turbine on natural gas; no duct firing
 - b. Mode 2: turbine and duct burner on natural gas
 - c. Mode 3: turbine on ULSD; no duct firing
 - d. Mode 4: turbine on ULSD; duct firing on natural gas

4. The Permittee shall conduct initial stack emissions testing within 60 days of achieving the maximum production rate, but not later than 180 days after initial startup. The Permittee shall submit test results within 60 days after completion of testing.

- C. Recurrent stack testing of all pollutants listed in Part V.B of this permit shall be performed within five years from the date of the previous stack test. Testing shall be as described in Part V.B of this permit with the following exceptions:
 1. After the initial performance test, stack testing may not be required for pollutants requiring CEM.
 2. The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.

- D. Fuel oil analysis of the arsenic in the distillate oil may be substituted for stack testing while firing distillate oil. Arsenic testing is not required for natural gas firing.

- E. Stack emissions test results shall be reported as follows: all pollutants in units of lb/hr, NO_x, CO, VOC, formaldehyde and ammonia in units of ppmvd at 15% O₂.

PART VI. SPECIAL REQUIREMENTS

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

Title 40 CFR Part 60 Subpart A – General provisions

Title 40 CFR Part 60 Subparts KKKK – Standards of Performance for Stationary Combustion Turbines

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 with 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]
- D. The Permittee shall resubmit for review and approval a Best Available Control Technology (BACT) analysis if such construction or phased construction has not commenced within the 18 months following the commissioner’s approval of the current BACT determination (i.e., the date of this permit) for such construction or phase of construction. [RCSA §22a-174-3a(i)(4)]

PART VII. COLLATERAL CONDITIONS FOR EU-53, EU-54 and GEU-1

- A. **EU-53:** 2.6 MMBtu/hr Cummins CFP9E-F60 emergency fire pump engine

1. Operational Conditions

- a. Fuel Type: ULSD
- b. Maximum Fuel Sulfur Content: 0.0015% by weight
- c. Maximum Hours of Operation over any Consecutive 12 Month Period: 295 hours

2. Criteria and Non-Criteria Pollutants

Pollutant	lb/hr	Other Units	TPY
PM/PM ₁₀ / PM _{2.5}	0.1	0.15 g/hp-hr	0.014
NO _x	1.8		0.3
VOC	0.1		0.01
(NO _x +NMHC)		3.0 g/hp-hr	
CO	1.1	2.6 g/hp-hr	0.17
Sulfuric Acid (H ₂ SO ₄)	0.0006		0.0001
CO _{2e}	427	163 lb/MMBtu	63

Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- SO₂, H₂SO₄: Calculated from fuel sulfur content
- NO_x, PM_{10/2.5}, VOC, CO: EPA Certified Vendor Emissions Factor
- Pb: AP-42 Sec. 3.1 (April 2000)
- CO₂: 40 CFR Part 98 Subpart C, Table C-1
- CO_{2e}: 40 CFR Part 98, Subpart C, Table C-2

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.

3. Monitoring and Record Keeping

a. Monitoring

- The Permittee shall continuously monitor fuel consumption by this unit using a non-resettable totalizing fuel meter.
- The Permittee shall monitor the number of hours that this unit is in operation.

b. Record Keeping

- The Permittee shall calculate and record the monthly and consecutive 12 month PM₁₀, PM_{2.5}, NO_x, VOC, H₂SO₄, CO_{2e} 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.
- The Permittee shall monitor and keep records of monthly and 12 consecutive months operating hours of the emergency fire pump. The 12 consecutive month time period shall be determined by adding the current month's operating hours to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
- The Permittee shall keep any of the records listed below to demonstrate the sulfur content of the fuel used.
 - A sales receipt for the sale of motor vehicle diesel fuel from a retail location; or
 - A copy of the current contract with the fuel supplier supplying the fuel used by the unit that includes the applicable sulfur content of nongaseous fuel as a condition of each shipment.
- The Permittee shall comply with all applicable sections of the following National Emission Standards for Hazardous Air Pollutants at all times.

Title 40 CFR Part 60 Subpart III – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Note: The emergency fire pump engine is subject to 40 CFR Part 63 Subpart ZZZZ and complies with the requirements by operating under 40 CFR Part 60 Subpart IIII.

- v. The Permittee shall keep records of the manufacturer's specifications and written recommendations.
- vi. The Permittee shall keep records on the premises indicating continual compliance with the above condition at all times and shall make them available upon request by the commissioner for the duration of this permit, or for the previous five years, whichever is less.

c. Reporting

- i. The Permittee shall notify the commissioner, in writing, of the date of commencement of construction and commencement of operation of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.
- ii. 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.

B. EU-54: Auxiliary Cooling Tower

1. Criteria and Non-Criteria Pollutants

Pollutant	lb/hr	TPY
PM/PM ₁₀ / PM _{2.5}	0.16	0.71

Demonstration of compliance with the above emission limits may be met by calculating the emission rates using the cooling tower flow rate (gallons/min), TDS content of the cooling water and drift rate from the manufacturer.

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.

2. Record Keeping

- a. The Permittee shall calculate and record the monthly and consecutive 12 month PM/PM₁₀/PM_{2.5} in units of tons. The consecutive 12 month emissions shall be determined by adding 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.
- b. The Permittee shall keep records of the manufacturer's specifications and written recommendations.
- c. The Permittee shall keep records on the premises indicating continual compliance with the above condition at all times and shall make them available upon request by the commissioner for the duration of this permit, or for the previous five years, whichever is less.

3. Reporting

- a. The Permittee shall notify the commissioner, in writing, of the date of commencement of construction and commencement of operation of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.
- b. 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.

C. GEU-1: HVAC/Space Heaters

Separate, small emission units consisting of: building space heaters, makeup air heaters, and heating ventilating and air conditioning (HVAC) units.

1. Operational Conditions

- a. Fuel Type: Natural Gas

2. Criteria and Non-Criteria Pollutants

Pollutant	TPY
PM/PM ₁₀ / PM _{2.5}	0.6
SO ₂	0.05
NO _x	7.6
CO	6.4
VOC	0.4
Lead	0.00004
Sulfuric Acid	0.007
CO _{2e}	9,061

Note: Permittee shall add emissions from GEU-1 to the emissions from relevant emission units to demonstrate compliance with emission limits set forth in Part III.C and Part III.H.4 of this permit.

Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- NO_x, PM/PM₁₀/PM_{2.5}, VOC, CO, SO₂, Pb: AP-42 Sec. 1.4 (July 1998)
- H₂SO₄: Engineering estimate based on SO₂
- CO₂: 40 CFR Part 98 Subpart C, Table C-1

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.

3. Monitoring and Record Keeping

a. Monitoring

The Permittee shall continuously monitor fuel consumption for GEU-1 using a single non-resettable totalizing fuel meter.

b. Record Keeping

- i. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption for GEU-1. The consecutive 12 month fuel consumption shall be determined by adding 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.
- ii. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM₁₀, PM_{2.5}, NO_x, VOC, SO₂, H₂SO₄, lead, CO and CO_{2e} emissions in units of Tons for all units in GEU-1 combined. 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.
- iii. The Permittee shall make and maintain a list of all units included in GEU-1. The list shall include description and maximum rated capacity of the HVAC/space heaters. The Permittee shall update the list within 30 days of a change in the units.
- iv. The Permittee shall keep records on the premises indicating continual compliance with the above condition at all times and shall make them available upon request by the commissioner for the duration of this permit, or for the previous five years, whichever is less.

PART VIII. COLLATERAL CONDITIONS FOR NO_x AND VOC OFFSETS

To comply with RCSA §22a-174-3a(l), the Permittee shall possess, at least 178 tons of external emission reduction (ERC) to offset the quantity of NO_x and 41 tons of ERCs to offset the quantity of VOC emitted from the following sources:

- Dual fuel fired General Electric (GE) Model 7HA.02 combustion turbine with duct burner operating under Permit No. 015-0299
- One auxiliary boiler operating under Permit No. 015-0300
- One emergency generator operating under Permit No. 015-0301
- One emergency fire pump operating under collateral conditions in Part VII.A of Permit No. 015-0299
- One Cooling Tower operating under collateral conditions in Part VII.B of Permit No. 015-0299
- Three fuel storage tanks
- HVAC units, makeup air heaters and building space heaters (GEU-1) operating under collateral conditions in Part VII.C of Permit No. 015-0299

Such a quantity is sufficient to offset the emissions at a ratio of 1.3 to 1 ton of reduction for every ton of NO_x and VOC emissions allowed under the permits listed above. Specifically, the reductions are real, quantifiable, surplus, permanent and enforceable as defined in RCSA 22a-174-3a(l)(5). The Permittee shall maintain sole ownership and possession of these emissions reductions for the duration of this permit and any subsequent changes to the permit.

Such offsets have been obtained from the following sources:

NO_x offsets:

- The Permittee used 115 tons of Emission Reduction Credits (ERCs) from PSEG – Bridgeport Harbor Station. The ERCs have Serial Numbers: CT4NO_x00-015-0045-7668-115.
- The Permittee acquired 63 tons of ERCs from the New York Power Authority: NY-DEC-2-6301-00084-63

VOC Offset:

- The Permittee acquired 41 tons of ERCs from Element Markets, LLC: NY-DEC-2-6401-00042-41

The Permittee may be required to obtain additional NO_x and VOC offsets and complete additional ambient air quality analysis to show that the National Air Ambient Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments have not been violated, if observed steady state or transient emissions exceed a limit specified in Parts III of this permit.

PART IX. 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.