



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:	GenConn Middletown LLC
Address:	P.O. Box 1001, Middletown, CT 06457
Equipment Location:	1866 River Road, Middletown, CT 06457
Equipment Description:	50 MW General Electric LM6000PC combustion turbine (Unit 12)

Town-Permit Numbers:	104-0144
Premises Number:	24
Prior Permit Issue Dates:	August 27, 2008 (Permit to Construct & Operate) June 26, 2009 (Revision) August 29, 2011 (Minor Modification)
Modification Issue Date:	January 17, 2013
Expiration Date:	None

/s/ Anne Gobin for
Daniel C. Esty
Commissioner

January 17, 2013
Date

PERMIT FOR FUEL BURNING EQUIPMENT

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION BUREAU OF AIR MANAGEMENT

The conditions on all pages of this permit shall be verified at all times except those noted as design specifications.

PART I. DESIGN SPECIFICATIONS

A. General Description

GenConn Middletown LLC operates four (4) identical General Electric LM6000PC peaking power combustion turbines at the Middletown Power LLC Middletown, CT generating plant. The four units are rated at a nominal output of 50 MW each.

B. Equipment Design Specifications

1. Maximum Fuel Firing Rate(s): 465,569 scf/hr (gas); 3,368 gal/hr (oil)
2. Maximum Gross Heat Input (MMBTU/hr): 474.9 (gas); 456.9 (oil)

C. Control Equipment Design Specifications

1. Selective Catalytic Reduction (SCR)

Make and Model: Express Integrated Technologies
Catalyst Type: Honeycomb

2. Water injection (gas and oil firing)

The above NOx controls will have a guaranteed NOx emission rate of 2.5 ppmvd (gas) and 5.9 ppmvd (oil) at 15% O₂.

3. Oxidation Catalyst - Carbon Monoxide

Make and Model: Express Integrated Technologies
Catalyst Type: Honeycomb

D. Stack Parameters

1. Minimum Stack Height (ft): 213
2. Minimum Stack Diameter (ft): 12
3. Minimum Exhaust Gas Flow Rate at 100% load (acfm): 646,840 (gas); 631,381 (oil)
4. Minimum Stack Exit Temperature at 100% load (°F): 826 (gas); 839 (oil)
5. Minimum Distance from Stack to Property Line (ft): 125

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PART II. OPERATIONAL CONDITIONS

A. Fuel Limitation:

1. Fuel Type(s): Natural Gas, Distillate oil (ULSD)
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 2,312 x 10⁶ scf (gas)**; 8,363 x 10³ gallons (oil)**
3. Maximum Fuel Sulfur Content (% by weight, dry basis): 0.0015 (oil)

The permittee shall use the following equation to determine the maximum amount of fuel available to be burned in this turbine and in addition to permit numbers 104-0145, 104-0146, and 104-0147 to comply with the emission limits in Part VI.A.3 of this permit.

$$\text{Maximum Natural Gas Use} = \text{Fuel}_{\text{ng}} - (C) \times \text{Fuel}_{\text{oil}}$$

Where:

C = constant = 276.45
 Fuel_{ng} = 2,312x10⁶ scf natural gas
 Fuel_{oil} = gallons of distillate fuel burned.
 (Not to exceed 8,363 x 10³ gal/yr)

**** Note:** Fuel limitation is the maximum annual natural gas and/or distillate oil to be combusted in this unit as well as permit numbers 104-0145, 104-0146, and 104-0147.

PART III. CONTINUOUS EMISSION MONITORING REQUIREMENTS AND ASSOCIATED EMISSION LIMITS (Applicable if -X- Checked)

The Permittee shall comply with the CEM requirements as set forth in RCSA Section 22a-174-4. CEM shall be required for the following pollutant/operational parameters and enforced on the following basis:

<u>Pollutant/Operational Parameter</u>	<u>Averaging Times</u>	<u>Emission Limit</u>	<u>Units</u>
Water-to-fuel ratio	continuous	***	gal/gal (oil)
Fuel Consumption	continuous		gal (oil) scf (gas)

***** Note:** Ratio will be determined by the initial performance test to show compliance with NOx emission rates in Part VI of this permit.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall use a non-resettable totalizing fuel metering device or a billing meter to continuously monitor fuel feed to this turbine.

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

2. The Permittee shall continuously monitor and continuously record the SCR ammonia injection rate (lb/hr), operating temperature (°F) and pressure drop (inches of water). The Permittee shall maintain these parameters within the ranges recommended by the manufacturer to achieve compliance with the emission limits in this permit.
3. The Permittee shall continuously monitor and continuously record the oxidation catalyst inlet temperature (°F). The Permittee shall maintain this parameter within the range recommended by the manufacturer to achieve compliance with the emission limits in this permit.
4. The Permittee shall inspect the SCR and CO oxidation catalysts once per year, at a minimum.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel usage (for each fuel) 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 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-10/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.

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

4. The Permittee shall keep records of the inspection and maintenance of the SCR and oxidation catalyst. The records shall include the name of the person, the date, the results or actions and the date the catalyst is replaced.
5. The Permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the combustion turbine; 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)]
6. The Permittee shall make and keep records pursuant to RCSA 22a-174-19a(i).
7. The permittee shall make and keep records on premises to determine compliance with the terms and conditions of this permit in accordance with RCSA 22a-174-4. Such records shall be made available upon request by the Commissioner and kept for the duration of this permit or for the previous five (5) years, whichever is less.

C. Reporting

1. The permittee shall submit all required reports to the Commissioner as required pursuant to Sections 22a-174-19a(j), 22a-174-22(1) and 40 CFR 60.4375.
2. The Permittee shall notify the commissioner, in writing, of the commencement of construction, completion of construction and commencement of commercial operation of this source. Such written notifications shall be submitted no later than 30 days after the subject event. Commencement of commercial operations shall mean the date when the unit is released to ISO-New England for dispatch.
3. The Permittee shall notify the commissioner in writing of any malfunction of the stationary gas turbine, the air pollution control equipment or the continuous monitoring system. The Permittee shall submit such notification within ten (10) days of the malfunction. A Deviation Report as required by the site's Title V Operating Permit would meet the requirements of this section. 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,

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

- 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.

PART V. OPERATIONAL AND MAINTENACE 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 stationary combustion 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. [40 CFR §60.4333(a)]
- B. The Permittee shall keep records, when turbines are changed for routine maintenance, to include the following:
1. The date the turbine was changed,
 2. The reason for the change,
 3. Documentation that the replacement turbine is the same make and model number, and
 4. Documentation the replacement turbine does not result in an increase in emissions, the emission of any new air pollutants, or increases in electrical output of the turbine.
- C. The Permittee shall properly operate the control equipment at all times that this turbine is in operation and emitting air pollutants except as allowed in PART VI of this permit.

PART VI. ALLOWABLE EMISSION LIMITS

The Permittee shall not exceed the emission limits stated herein:

A. Steady State (50%-100% load) at ISO conditions

1. Natural Gas:

Criteria Pollutants	lb/hr	ppmvd @15% O ₂
PM-10/2.5	6.0	
SOx	0.26	
NOx	4.35	2.5

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PART VI. ALLOWABLE EMISSION LIMITS, continued

<u>Criteria Pollutants</u>	<u>lb/hr</u>	<u>ppmvd @15% O₂</u>
VOC	1.11	
CO	8.0	5.0

2. ULSD fuel oil:

<u>Criteria Pollutants</u>	<u>lb/hr</u>	<u>ppmvd @15% O₂</u>
PM-10/2.5	12.0	
SOx	0.70	
NOx	8.0	5.9
VOC	0.75	
CO	0.75	1.0
Lead	6.4E-3	

3. Maximum Allowable Emissions:

<u>Criteria Pollutants</u>	<u>tpy</u>
PM-10/2.5	14.9
SOx	0.9
NOx	10.8
VOC	2.8
CO	19.9
Lead	7.94E-3

<u>Non-Criteria Pollutants</u>	<u>ppmvd @15% O₂</u>
Ammonia	5.0

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PART VI. ALLOWABLE EMISSION LIMITS, continued

B. Start-up and Shutdown

1. The Permittee shall minimize emissions during periods of start-up and shutdown by the following work practices and time constraints. Start the ammonia injection as soon as minimum catalyst temperature is reached. The oxidation catalyst will not be bypassed during start-up or shutdown. The duration of start-up and malfunction shall not exceed 60 minutes. The duration of shutdown shall not exceed 30 minutes. Emissions during these periods shall be counted towards the annual emission limits stated herein.
2. Start-Up/Shut-Down

Gas Firing	Start-Up	Shut-Down
NOx (lbs/Hr)	20	25
CO (lbs/hr)	32	54
Oil Firing		
NOx (lbs/hr)	40	50
CO (lbs/hr)	18	18

- C. **Hazardous Air Pollutants:** This unit shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) listed in RCSA Section 22a-174-29. [**STATE ONLY REQUIREMENT**]
- D. **OPACITY:** The Permittee shall not exceed 10% during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

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

1. PM, NOx, CO, Ammonia: Most recent stack test data.
2. NOx, CO start-up/shut-down emission rates: Manufacturer's Data
3. SOx: Calculated from 0.0015%S or less in fuel oil.
4. VOC: Manufacturer's Data
5. Pb: AP-42, Table 3, dated 04/00.

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

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PART VI. ALLOWABLE EMISSION LIMITS, continued

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 VII. STACK EMISSION TEST REQUIREMENTS (Applicable if -X- Checked)

Stack emission testing shall be performed in accordance with the Stack Test Guidelines on the DEEP website:

http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322076&depNav_GID=1619

None at this time

PM-10/2.5 SOx NOx CO VOC/HC Pb

Other (HAPs): Ammonia

NSPS NOx stack testing: Annual stack testing shall be conducted to demonstrate compliance with the NOx emission limits in accordance with 40 CFR §60.4400. If the NOx emission result from the performance test is less than or equal to 75% of the NOx emission limits of 25 ppmvd @ 15% O₂ when firing natural gas or 74 ppmvd @ 15% O₂ when firing distillate oil (ULSD) (Table 1 of 40 CFR Part 60 Subpart KKKK), the frequency of subsequent performance tests may be reduced to once every two years. As an alternative to stack testing to show compliance with the NSPS NOx emission limits, the Permittee may elect to use any of the continuous parameter monitoring methods allowed in 40 CFR §60.4340(b)(2)(iv)

In addition to the above NOx NSPS stack testing requirements. Stack testing for NOx, CO and ammonia shall be conducted every five years starting from the date of the initial stack test to demonstrate compliance with their respective permit limits. Stack testing for PM-10/2.5 shall be conducted to demonstrate initial compliance with the limits in Part VI of this permit.

Stack test results shall be reported as follows: all pollutants in units of lb/hr and PM-10/2.5 in units of lb/MMBTU, NOx and CO in units of ppmvd at 15% O₂, ammonia in units of µg/m³ and ppmvd at 15% O₂.

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PART VIII. 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, Subparts KKKK and A ****

- B.** The Permittee shall comply with all applicable sections of the following National Emission Standard(s) at all times.

Title 40 CFR Part 63, Subparts YYYY and A ****

- C. STATE ONLY REQUIREMENT:** 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.

- D.** The Permittee shall comply with all applicable requirements of the Federal Acid Rain Program as set forth in Title 40 CFR Parts 72-78, inclusive.

****** Note:** Copies may be obtained online at the U.S. Government Printing Office website.

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

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PART IX. ADDITIONAL TERMS AND CONDITIONS, continued

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.

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PART IX. ADDITIONAL TERMS AND CONDITIONS, continued

- 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.

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