



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE  
GOVERNOR

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COMMISSIONER

University of Maine  
Penobscot County  
Orono, Maine  
A-204-77-7-A

Departmental  
Findings of Fact and Order  
New Source Review  
NSR #7

**FINDINGS OF FACT**

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Maine Department of Environmental Protection (Department) finds the following facts:

**I. REGISTRATION**

A. Introduction

FACILITY	University of Maine
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	611310
NATURE OF BUSINESS	Educational Facility
FACILITY LOCATION	5765 Service Building and throughout the Orono Campus.

The University of Maine, an educational facility located in Orono, Maine, operates various fuel burning units for the facility's steam and heating needs. Additional equipment includes emergency generators and printing facilities.

B. Amendment Description

The University of Maine has submitted a New Source Review amendment application to license a 250 kW natural gas emergency generator as a replacement of the existing 55 kW propane fueled generator located at Memorial Gym.

C. Emission Equipment

The following equipment is addressed in this air emission license:

AUGUSTA  
17 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0017  
(207) 287-7688 FAX: (207) 287-7826  
RAY BLDG., HOSPITAL ST.

BANGOR  
106 HOGAN ROAD, SUITE 6  
BANGOR, MAINE 04401  
(207) 941-4570 FAX: (207) 941-4584

PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769  
(207) 764-0477 FAX: (207) 760-3143

**Generator**

<u>Equipment</u>	<u>Maximum Input Capacity (MMBtu/hr)</u>	<u>Kilowatt (kW)</u>	<u>Firing Rate (scf/hr)</u>	<u>Fuel Type</u>	<u>Manufacture &amp; Installation Date</u>
Memorial Gym Emergency Generator	3.6	250	3522	natural gas	2013

D. Application Classification

The modification of a major source is considered a major modification based on whether or not expected emissions increases exceed the “Significant Emission Increase Levels” as given in *Definitions Regulation*, 06-096 CMR 100 (as amended).

The emission increases due to the proposed Memorial Gym emergency generator were calculated based on operational limit of 500 hour per year. The results of the calculations are as follows:

<u>Pollutant</u>	<u>Future Generator Licensed Allowed (ton/year)</u>	<u>Significance Emissions Increase Levels (ton/year)</u>
PM	0.008	25
PM <sub>10</sub>	0.008	15
PM <sub>2.5</sub>	0.008	10
SO <sub>2</sub>	0.0005	40
NO <sub>x</sub>	0.008	40
CO	0.11	100
VOC	0.08	40
CO <sub>2e</sub>	<75,000	75,000

Note: The above numbers are for the Memorial Gym emergency generator only. None of the other equipment at the facility is affected by this amendment.

Based on the table above, this amendment is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations* 06-096 CMR 115 (as amended) since the changes being made are not addressed or prohibited in the Part 70 air emission license. An application to incorporate the requirements of this amendment into the Part 70 air emission license shall be

submitted no later than 12 months from commencement of the requested operation.

## II. BEST PRACTICAL TREATMENT (BPT)

### A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

### B. Memorial Gym Emergency Generator

The University of Maine has proposed the installation of a new 250 kilowatt emergency generator to be located at the Memorial Gym. The emergency generator, manufactured in 2013, is a Caterpillar Olympian unit equipped with a model G250LG engine rated at 3.6 MMBtu/hr, firing natural gas (3522 scf/hr). The 379.1 horsepower emergency generator is classified as a spark-ignited, 4-stroke rich-burn reciprocating internal combustion engine. The unit replaces an existing 55 kilowatt propane-fueled generator that was not addressed in the current license since it was classified as an insignificant activity based on its size.

#### 1. BACT Findings

The Memorial Gym Emergency Generator will be properly operated and maintained to minimize PM emissions. The use of natural gas will minimize SO<sub>2</sub> emissions. NO<sub>x</sub>, CO, and VOC emissions will be met through an engine design that is compliant with 40 CFR Part 60, Subpart JJJJ requirements. NO<sub>x</sub> control includes Non-selective Catalytic Reduction (NSCR) with a three-way catalytic muffler. The three-way catalyst utilizes oxygen from the exhaust compounds to further reduce emissions.

The BACT emission limits for the Memorial Gym Emergency Generator are based on the following:

- PM/PM<sub>10</sub> - 0.0095 lb/MMBtu from AP-42 Table 3.2-3 (dated 7/2000)
- SO<sub>2</sub> - 0.0006 lb/MMBtu from AP-42 Table 3.2-3 (dated 7/2000)
- NO<sub>x</sub> - the use of Non-selective Catalytic Reduction (NSCR) and manufacturer data of 0.03 g/bhp-hr
- CO - manufacturer data of 0.53 g/bhp-hr
- VOC - manufacturer data of 0.38 g/bhp-hr
- Opacity - 06-096 CMR 115, BACT

The BACT emission limits for the emergency generator are the following:

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Memorial Gym Emergency Generator (3.6 MMBtu/hr) natural gas	0.03	0.03	0.002	0.03	0.44	0.32

Visible emissions from the Memorial Gym Emergency Generator shall not exceed 10% opacity on a 6-minute block average, except for no more than two (2) six (6) minute block averages in a 3-hour period.

The emergency generator shall be limited to 500 hours of operation a year, based on a 12-month rolling total. The University of Maine shall keep records of the hours of operation of the unit.

2. 40 CFR Part 60, Subpart JJJJ

The federal regulation 40 CFR Part 60, Subpart JJJJ, *Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE)* is applicable to the Memorial Gym Emergency Generator since the unit was ordered after June 12, 2006 and manufactured after January 1, 2009. By meeting the requirements of Subpart JJJJ, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ.

a. Emergency Definition:

Emergency stationary ICE means any stationary reciprocating internal combustion engine that meets all of the following criteria:

- (1) The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or

equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc.

- (2) Paragraph (1) above notwithstanding, the emergency stationary ICE may be operated for any combination of the purposes specified below for a maximum of 100 hours per calendar year:
- (i) Maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.
  - (ii) Emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.
  - (iii) Periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.
- (3) Paragraphs (1) and (2) above notwithstanding, emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. These 50 hours are counted as part of the 100 hours per calendar year for maintenance checks and readiness testing, emergency demand response, and periods of voltage deviation or low frequency, as provided in paragraph (2) above.

The 50 hours per calendar year for non-emergency situations cannot be used for peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity, except if the following conditions are met:

- (i) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.

- (ii) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
- (iii) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
- (iv) The power is provided only to the facility itself or to support the local transmission and distribution system.
- (v) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

[40 CFR §60.4243(d) and §60.4248]

b. 40 CFR Part 60, Subpart JJJJ Requirements:

(1) Manufacturer Certification Requirement

The generator shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 CFR Part 60, Subpart JJJJ, Table 1. An EPA certificate of conformity was submitted with the application.

(2) Non-Resettable Hour Meter Requirement

A non-resettable hour meter shall be installed and operated on the generator. [40 CFR §60.4237]

(3) Operation and Maintenance Requirement

The generator shall be operated and maintained according to the manufacturer's written instructions or procedures developed by facility that are approved by the engine manufacturer. The University of Maine may only change those settings that are permitted by the manufacturer. [40 CFR §60.4243]

(4) Annual Time Limit for Maintenance and Testing

The generator shall be limited to 100 hours/year for maintenance and testing. The emergency engine may operate up to 50 hours per year in non-emergency situations, but those 50 hours are included in the 100 hours allowed for maintenance and testing. The 50 hours for non-emergency use cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply

power as part of a financial arrangement with another entity. [40 CFR §60.4243(d)]

(5) Annual Reporting Requirement for Demand Response Availability Over 15 Hours Per Year (for generators greater than 100 brake hp)

If the University of Maine operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4243(d)(3)(i), the facility shall submit an annual report containing the information in §60.4245(e)(1)(i) through (vii). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

Director, Office of Ecosystem Protection  
U.S. Environmental Protection Agency  
5 Post Office Square, Suite 100  
Boston, MA 02109-3912

[40 CFR §60.4245(e)]

C. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review amendment shall apply to the facility upon amendment issuance. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 1(C)(8), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115, the source must then apply for an amendment to the Part 70 license within one year of commencing the proposed operations as provided in 40 CFR Part 70.5.

D. Annual Emissions

The University of Maine shall be restricted to the following annual emissions from the facility based on the limits for the most recently licensed proposed steam plant project (once landfill gas is initially delivered to the steam plant), 8760

hours/year operation each for the two Global Science Center Boilers, and 500 hours/year for each of the generators:

**Annual Facility Tons/year**  
 (used in the annual license fee calculation)

	PM	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Steam Plant Boilers #5, #6, #7, #8	32.2	21.2	135.8	100.5	116.3	26.3
Global Science Ctr Boilers (total of two)	4.6	4.6	-	14.0	11.4	0.4
Portable Electric Generator	0.1	0.1	0.05	2.0	0.5	0.03
Hitchner Hall Generator	0.1	0.1	0.05	2.3	1.0	0.03
Aubert Hall Generator	0.1	0.1	0.04	2.3	0.7	0.04
Barrows Hall Generator	0.1	0.1	0.04	2.3	0.7	0.04
Recreation Center Generator	0.1	0.1	0.05	1.5	0.2	0.03
Hilltop Commons Generator	0.2	0.2	0.07	2.9	0.2	0.03
Collins Center Generator	0.12	0.12	0.05	1.30	0.37	0.02
Alfond Generator	0.03	0.03	0.001	0.72	0.17	0.02
Neville Hall Data Center Generator	0.03	0.03	0.003	4.26	0.28	0.04
Memorial Gym Generator	0.008	0.008	0.0005	0.008	0.11	0.08
Printing Services						2.0
<b>TOTALS</b>	<b>37.69</b>	<b>26.69</b>	<b>136.15</b>	<b>134.09</b>	<b>131.93</b>	<b>29.06</b>

**III. AMBIENT AIR QUALITY ANALYSIS**

Based on the proposed emission limits and no extenuating circumstances surrounding the generator and its location, the Department has determined that an ambient air quality impact modeling is not required for this licensing action.

**ORDER**

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-204-77-7-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the standard and special conditions below.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

### SPECIFIC CONDITIONS

#### (1) Memorial Gym Emergency Generator

A. The Memorial Gym Emergency Generator is limited to 500 hours per year total operation, based on a 12-month rolling total. Compliance shall be demonstrated by a written log of all generator operating hours. [06-096 CMR 115]

B. Emissions shall not exceed the following:

<u>Unit</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>	<u>Origin and Authority</u>
Memorial Gym Emergency Generator	PM	0.0095	06-096 CMR 115, BACT

C. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

<u>Unit</u>	<u>PM (lb/hr)</u>	<u>PM<sub>10</sub> (lb/hr)</u>	<u>SO<sub>2</sub> (lb/hr)</u>	<u>NO<sub>x</sub> (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOC (lb/hr)</u>
Memorial Gym Emergency Generator (3.6 MMBtu/hr) Natural gas	0.03	0.03	0.002	0.03	0.44	0.32

D. Visible Emissions

Visible emissions from the Memorial Gym Emergency Generator shall not exceed 10% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 115, BACT]

E. Control Equipment

The Memorial Gym Emergency Generator shall be equipped with Non-selective Catalytic Reduction (NSCR) with a three-way catalyst. The University of Maine shall maintain the control equipment according to the manufacturers recommended instructions. [06-096 CMR 115, BACT]

F. The Memorial Gym Emergency Generator shall meet the applicable requirements of 40 CFR Part 60, Subpart JJJJ, including the following:

1. Manufacturer Certification

The generator shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 CFR Part 60, Subpart JJJJ, Table 1.

2. Non-Resettable Hour Meter

A non-resettable hour meter shall be installed and operated on the generator. [40 CFR §60.4237 and 06-096 CMR 115, BPT]

3. Annual Time Limit for Maintenance and Testing

The generator shall be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity unless the conditions in §60.4243(d)(3)(i) are met). The limits are based on a calendar year. Compliance shall be demonstrated by a written log of all generator operating hours. [40 CFR §60.4243(d) and 06-096 CMR 115]

4. Operation and Maintenance

The generator shall be operated and maintained according to the manufacturer's written instructions or procedures developed by the University of Maine that are approved by the engine manufacturer. The University of Maine may only change those settings that are permitted by the manufacturer. [40 CFR §60.4243]

5. Annual Reporting For Demand Response Availability Over 15 Hours Per Year (for generators greater than 100 brake hp)

If the University of Maine operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4243(d)(3)(i), the facility shall submit an annual report containing the information in §60.4245(e)(1)(i) through (vii). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must

be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

Director, Office of Ecosystem Protection  
U.S. Environmental Protection Agency  
5 Post Office Square, Suite 100  
Boston, MA 02109-3912

[40 CFR §60.4245(e)]

- (2) The University of Maine shall submit an application to incorporate this amendment into the Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 CMR 140, Section 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 19 DAY OF August, 2013.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for  
PATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 5, 2013

Date of application acceptance: July 9, 2013

Date filed with the Board of Environmental Protection:

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.

