



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE  
GOVERNOR

PAUL MERCER  
COMMISSIONER

**University of Maine  
Penobscot County  
Orono, Maine  
A-204-77-9-A**

**Departmental  
Findings of Fact and Order  
New Source Review  
NSR #8**

**FINDINGS OF FACT**

After review of the air emissions New Source Review license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (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 (NSR) license application to license a new 60 kW propane fired emergency generator as a replacement for the existing 40 kW propane fired generator located at York Hall. The generator will also be licensed to fire natural gas in the event this fuel becomes available.

C. Emission Equipment

The following equipment is addressed in this NSR license:

**Electrical Generation Equipment**

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Power Output (kW)</u>	<u>Firing Rate (scf/hr)</u>	<u>Fuel Type</u>	<u>Manufacture / Installation Date</u>
York Hall	0.91	60	370.2	Propane	2015/2016
Emergency Generator	0.95	60	933.8	Natural Gas	2015/2016

D. Application Classification

The application for the University of Maine does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing or record keeping.

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 Code of Maine Rules (CMR) 100 (as amended).

The emission increases due to the proposed York Hall emergency generator were calculated based on an operational limit of 100 hours per year of non-emergency operation. Annual emissions from the generator being replaced were not previously quantified in the facility’s license; therefore, emissions increases were conservatively based on licensed emissions from the proposed unit alone. The results of the calculations are as follows:

<u>Pollutant</u>	<u>Future Generator License Allowed (ton/year)</u>	<u>Significant Emissions Increase Levels (ton/year)</u>
PM	0.001	25
PM <sub>10</sub>	0.001	15
PM <sub>2.5</sub>	0.001	10
SO <sub>2</sub>	0.001	40
NO <sub>x</sub>	0.059	40
CO	0.94	100
VOC	0.009	40
CO <sub>2</sub> e	<75,000	75,000

Note: The above numbers are for the York Hall Emergency Generator only. None of the other equipment at the facility is affected by this NSR license.

Because the emissions increases do not exceed the specified emission increase levels, the NSR license 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 NSR license into the Part 70 air emission license has been submitted.

## 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. York Hall Emergency Generator

The University of Maine has proposed the installation of a new 60 kilowatt emergency generator to be located at York Hall. The emergency generator, manufactured in 2015, is a Cummins unit equipped with a model QSJ5.9G-G2 engine rated at 0.95 MMBtu/hr when firing natural gas (933.8 scf/hr) and rated at 0.91 MMBtu/hr when firing propane (370.2 scf/hr). The emergency generator is classified as a spark-ignition, 4-stroke rich-burn reciprocating internal combustion engine. The unit replaces an existing 40 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 York Hall Emergency Generator will be properly operated and maintained to minimize PM emissions. The use of propane or natural gas will minimize SO<sub>2</sub> emissions. BACT for 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.

The BACT emission limits for the York Hall Emergency Generator are based on the following:

- \*PM/PM<sub>10</sub> - 0.019 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> - manufacturer data of 5.35 g/bhp-hr
- \*\*CO - manufacturer data of 85.09 g/bhp-hr
- \*\*VOC - manufacturer data of 0.80 g/bhp-hr
- Opacity - 06-096 CMR 115, BACT

\*Emission rates for PM<sub>10</sub> and SO<sub>2</sub> are based on AP-42, Chapter 3, Section 3.2, Table 3.2-3. Filterable and condensable particulates are included in PM<sub>10</sub> emission rate.

\*\* Emission rates for NO<sub>x</sub>, CO, VOC are based on manufacturer's emission data when firing propane, which is the worst case rate when compared to natural gas.

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)
York Hall Emergency Generator Propane & natural gas	0.018	0.018	0.0006	1.18	18.82	0.18

Visible emissions from the York Hall 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 100 hours of operation per year of non-emergency operation, based on calendar year 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 emergency engine listed above 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 meet 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. There is no time limit on the use of emergency stationary ICE in emergency situations.
- (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, 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 engine shall be certified by the manufacturer as meeting the emission standards for new non-road spark ignition engines found in 40 CFR Part 60, Subpart JJJJ, Table 1. The generator's certification was included in University of Maine's NSR license application.

(2) Non-Resettable Hour Meter Requirement

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

(3) Operation and Maintenance Requirement

The engine 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

As an emergency engine, the unit 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) Recordkeeping

The University of Maine shall keep records that include maintenance conducted on the engine and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the engine is operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4243(d)(3)(i), The University of Maine shall keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes. [40 CFR §60.4245(b)]

C. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review license shall apply to the facility upon 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; such application has been submitted by the source. This NSR license shall be incorporated into the Part 70 air emission license renewal currently in process.

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, 8760 hours/year operation each for the two Global Science Center Boilers, and 500 hours/year for each of the generators except for the new York Hall Emergency Generator which is limited to 100 hours of non-emergency operation.

**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
York Emergency Generator	0.001	0.001	0.0001	0.059	0.94	0.009
Printing Services						2.0
<b>TOTALS</b>	<b>37.69</b>	<b>26.69</b>	<b>136.16</b>	<b>134.15</b>	<b>132.87</b>	<b>29.07</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 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 NSR Air Emission License A-204-77-9-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the specific 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) York Hall Emergency Generator

- A. The York Hall Emergency Generator shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 CMR 115]
- B. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

<u>Unit</u>	<u>PM</u> <u>(lb/hr)</u>	<u>PM<sub>10</sub></u> <u>(lb/hr)</u>	<u>SO<sub>2</sub></u> <u>(lb/hr)</u>	<u>NO<sub>x</sub></u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>VOC</u> <u>(lb/hr)</u>
York Hall Emergency Generator Propane & natural gas	0.018	0.018	0.0006	1.18	18.82	0.18

#### C. Visible Emissions

Visible emissions from the York Hall 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]

- D. The Emergency Generator shall meet the applicable requirements of 40 CFR Part 60, Subpart JJJJ, including the following:
1. **Manufacturer Certification**  
The engine 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 engine. [40 CFR §60.4237 and 06-096 CMR 115, BACT]
  3. **Annual Time Limit for Maintenance and Testing**
    - a. As an emergency engine, the unit 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 records (electronic or written log) of all engine operating hours. [40 CFR §60.4243(d) and 06-096 CMR 115, BACT]
    - b. The University of Maine shall keep records that include maintenance conducted on the engine and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the engine is operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4243(d)(3)(i), the University of Maine shall keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes. [40 CFR §60.4245]

4. Operation and Maintenance

The engine 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]

DONE AND DATED IN AUGUSTA, MAINE THIS 1 DAY OF February, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Corne for  
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: December 29, 2015

Date of application acceptance: December 29, 2015

Date filed with the Board of Environmental Protection:

This Order prepared by Lisa P. Higgins, Bureau of Air Quality.

