



DEPARTMENT ORDER

**Unum Corporation
Cumberland County
Portland, Maine
A-657-71-N-A**

**Departmental
Findings of Fact and Order
Air Emission License
Amendment #2**

FINDINGS OF FACT

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

I. REGISTRATION

A. Introduction

Unum Corporation (Unum) was issued Air Emission License A-657-71-L-R/M on 5/3/13, for the operation of emission sources associated with their insurance office facility. The license was subsequently amended on 9/25/17 (A-657-71-M-M).

Unum has requested an amendment to their license in order to replace HO1-Generator #1 with a new unit designated HO1-Generator #1A.

The equipment addressed in this license amendment is located at 2211 Congress Street, Portland, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Stationary Engines

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (kW)	Fuel Type, % sulfur	Firing Rate (gal/hr)	Date of Manuf.	Date of Install.
HO1-Generator #1 *	1.6	150	Distillate fuel, 0.0015%	11.8	2010	2010
HO1-Generator #1A	1.4	125	Distillate fuel, 0.0015%	10.0	2020	2020

* Equipment removed from facility

C. Definitions

Distillate Fuel means the following:

- Fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials (ASTM) in ASTM D396;
- Diesel fuel oil numbers 1 or 2, as defined in ASTM D975;
- Kerosene, as defined in ASTM D3699;
- Biodiesel, as defined in ASTM D6751; or
- Biodiesel blends, as defined in ASTM D7467.

D. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the “Significant Emission” levels as defined in the Department’s *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

Pollutant	Current License (TPY)	Future License (TPY)	Net Change (TPY)	Significant Emission Levels
PM	3.1	3.1	0.0	100
PM ₁₀	3.1	3.1	0.0	100
SO ₂	0.1	0.1	0.0	100
NO _x	10.0	9.9	-0.1	100
CO	5.3	5.3	0.0	100
VOC	0.8	0.8	0.0	50

This modification is determined to be a minor modification and has been processed as such.

E. Facility Classification

With the annual fuel limit on the boilers and the operating hours restriction on the emergency generators, the facility is licensed as follows:

- As a synthetic minor source of air emissions because Unum is subject to license restrictions that keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

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 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

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

B. HO1-Generator #1A

Unum operates four emergency generators with HO1-Generator #1A being a new unit to replace HO1-Generator #1. HO1-Generator #1A is a generator set consisting of an engine and an electrical generator. HO1-Generator #1A has an engine rated at 1.4 MMBtu/hr which fires distillate fuel and was manufactured in 2020.

1. BACT Findings

a. Particulate Matter (PM and PM₁₀)

PM emissions from distillate fuel-fired engines are generally controlled through proper operation and maintenance of the engines. Given the small size of the unit (1.4 MMBtu/hr) and the limited operating hours, additional control for PM is not economically feasible.

BACT for PM/PM₁₀ emissions from HO1-Generator #1A shall be proper operation and maintenance of the unit and emission limits listed in the table below.

b. Sulfur Dioxide (SO₂)

For an emergency engine that fires distillate fuel and operates for only short periods of time, the use of a wet scrubber or other additional SO₂ add-on control methods are not economically feasible considering the minimal emissions due to the limited use of the engine. The most practical method for limiting SO₂ emissions of such engines is the use of low sulfur fuel, such as distillate fuel, with a sulfur content no greater than 0.0015% by weight.

BACT for SO₂ emissions from HO1-Generator #1A shall be the use of distillate fuel with a sulfur content no greater than 0.0015% by weight and SO₂ emission limits listed in the table below.

c. Nitrogen Oxides (NO_x)

Potentially available control options for reducing NO_x emissions from distillate fuel-fired engines include combustion controls, selective catalytic reduction (SCR), and selective non-catalytic reduction (SNCR). Combustion controls are implemented through design features such as electronic engine controls, injection systems, combustion chamber geometry, and turbocharging systems.

SCR and SNCR are both post-combustion NO_x reduction technologies. SCR injects ammonia to react with NO_x in the gas stream in the presence of a catalyst to form nitrogen and water. SNCR injects ammonia without the use of a catalyst to convert CO, NO_x, and hydrocarbons into carbon dioxide, nitrogen, and water, and requires strict air-to-fuel control to maintain high reduction effectiveness without increasing hydrocarbon emissions. For units of this size (1.4 MMBtu/hr) and usage (emergency back-up engine), neither SCR nor SNCR are economically feasible considering the small size of the unit and the minimal emissions due to the limited use of the engine.

BACT for NO_x emissions from HO1-Generator #1A shall be the use of good combustion controls, proper operation and maintenance of the unit, and the NO_x emission limit listed in the table below.

d. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

CO and VOC emissions are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. CO and VOC emissions from distillate fuel-fired engines are generally controlled through proper operation and maintenance. Oxidation catalysts have been used on larger engines to reduce CO and VOC emission levels in the exhaust, but, like SCR and SNCR, use of an oxidation catalyst on such small emergency engines with limited yearly use would not provide a significant environmental benefit and would not be economically feasible.

BACT for CO and VOC emissions from HO1-Generator #1A shall be proper operation and maintenance of the unit and emission limits listed in the table below.

2. The BACT emission limits for HO1-Generator #1A are based on the following:

- PM/PM₁₀ - 0.12 lb/MMBtu from 06-096 C.M.R. ch. 115, BACT
- SO₂ - combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
- NO_x - 4.41 lb/MMBtu from AP-42 dated 10/96
- CO - 0.95 lb/MMBtu from AP-42 dated 10/96
- VOC - 0.35 lb/MMBtu from AP-42 dated 10/96
- Visible Emissions - 06-096 C.M.R. ch. 115, BACT

3. The BACT emission limits for HO1-Generator #1A are the following:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
HO1-Generator #1A	0.16	0.16	--	6.04	1.30	0.48

4. Visible emissions from HO1-Generator #1A shall not exceed 20% opacity on a six-minute block average basis.
5. New Source Performance Standards (NSPS) 40 C.F.R. Part 60, Subpart III

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart III is applicable to the emergency engine listed above since the unit was ordered after July 11, 2005, and manufactured after April 1, 2006. [40 C.F.R. § 60.4200] By meeting the requirements of 40 C.F.R. Part 60, Subpart III, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart III requirements is listed below.

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart III, a stationary reciprocating internal combustion engine (ICE) is considered an **emergency** stationary ICE (emergency engine) as long as the engine is operated in accordance with the following criteria. Operation of an engine outside of the criteria specified below may cause the engine to no longer be considered an emergency engine under 40 C.F.R. Part 60, Subpart III, resulting in the engine being subject to requirements applicable to **non-emergency** engines.

(1) Emergency Situation Operation (On-Site)

There is no operating time limit on the use of an emergency engine to provide electrical power or mechanical work during an emergency situation. Examples of use of an emergency engine during emergency situations include the following:

- Use of an engine to produce power for critical networks or equipment (including power supplied to portions of a facility) because of failure or interruption of electric power from the local utility (or the normal power source, if the facility runs on its own power production);
- Use of an engine to mitigate an on-site disaster or equipment failure;
- Use of an engine to pump water in the case of fire, flood, natural disaster, or severe weather conditions; and
- Similar instances.

(2) Non-Emergency Situation Operation

An emergency engine may be operated up to a maximum of 100 hours per calendar year for maintenance checks, readiness testing, and other non-emergency situations as described below.

- (i) An emergency engine may be operated for a maximum of 100 hours per calendar year for 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 more than 100 hours per calendar year.
- (ii) An emergency engine may be operated for up to 50 hours per calendar year for other non-emergency situations. **However, these operating hours are counted as part of the 100 hours per calendar year operating limit described in paragraph (2) and (2) (i) above.**

The 50 hours per calendar year operating limit for other non-emergency situations cannot be used for peak shaving, 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.

b. 40 C.F.R. Part 60, Subpart III Requirements

(1) Manufacturer Certification Requirement

The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4202. [40 C.F.R. § 60.4205(b)]

(2) Ultra-Low Sulfur Fuel Requirement

The fuel fired in the engine shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 C.F.R. § 60.4207(b)]

(3) Non-Resettable Hour Meter Requirement

A non-resettable hour meter shall be installed and operated on the engine. [40 C.F.R. § 60.4209(a)]

(4) Operation and Maintenance Requirements

The engine shall be operated and maintained according to the manufacturer's emission-related written instructions. Unum may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

(5) Annual Time Limit for Maintenance and Testing

As an emergency engine, the unit shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, 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). [40 C.F.R. § 60.4211(f)]

(6) Initial Notification Requirement

No initial notification is required under 40 C.F.R. Part 60, Subpart III for emergency engines. [40 C.F.R. § 60.4214(b)]

(7) Recordkeeping

Unum 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 number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

C. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility’s annual air license fee. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on the following assumptions:

- Firing 100,000,000 scf/yr natural gas in the boilers; and
- Operating the generators for 100 hrs/yr each.

Please note, this information provides the basis for fee calculation only and should not be construed to represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

Total Licensed Annual Emissions for the Facility
Tons/year
 (used to calculate the annual license fee)

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Boilers	2.6	2.6	0.1	5	4.2	0.3
HO1-Generator #1A	0.1	0.1	--	0.3	0.1	0.1
HO2-Generator #2	0.1	0.1	--	0.6	0.1	0.1
HO3-Generator #3	0.1	0.1	--	0.2	0.1	0.1
Generator #4	0.1	0.1	--	1.9	0.4	0.1
Generator #5	0.1	0.1	--	1.9	0.4	0.1
Total TPY	3.1	3.1	0.1	9.9	5.3	0.8

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM ₁₀	25
SO ₂	50
NO _x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license amendment.

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, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-657-71-N-A subject to the conditions found in Air Emission License A-657-71-L-R/M, in amendment A-657-71-M-M, and the following conditions.

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

SPECIFIC CONDITIONS

The following shall replace Condition (17), sections C through F of Air Emission License A-657-71-L-R/M.

(17) Emergency Generators

C. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generator #4	PM	0.10	06-096 C.M.R. ch. 115, BPT
Generator #5	PM	0.10	06-096 C.M.R. ch. 115, BPT

D. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BPT/BACT]:

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
HO1-Generator #1A	0.16	0.16	--	6.04	1.40	0.48
HO2-Generator #2	0.32	0.32	0.01	11.72	2.52	0.96
HO3-Generator #3	0.12	0.12	0.01	4.47	0.96	0.36
Generator #4	2.01	2.01	0.03	38.88	7.45	0.72
Generator #5	2.01	2.01	0.03	38.88	7.45	0.72

E. Visible Emissions

Visible emissions from HO1-Generator #1A shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

Visible emissions from each of the emergency generators except for HO1-Generator #1A shall not exceed 20% opacity on a six-minute block average basis except for periods of startup during which time Unum may comply with the following work practice standards in lieu of the numerical visible emissions standard.
[06-096 C.M.R. ch. 101, § 3(A)(4)]

1. Maintain a log (written or electronic) of the date, time, and duration of all generator startups.
 2. Operate the generators in accordance with the manufacturer's emission-related operating instructions.
 3. Minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations shall apply.
 4. Operate the generators, including any associated air pollution control equipment, at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.
- F. HO1-Generator #1A and HO2-Generator #2 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BPT/BACT]

1. **Manufacturer Certification**

The engines shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in § 60.4202. [40 C.F.R. § 60.4205(b)]

2. **Ultra-Low Sulfur Fuel**

The fuel fired in the engines shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the fuel sulfur content limit shall be demonstrated by fuel delivery receipts from the supplier, fuel supplier certification, certificate of analysis, or testing of the tank containing the fuel to be fired. [40 C.F.R. § 60.4207(b) and 06-096 C.M.R. ch. 115, BPT]

3. **Non-Resettable Hour Meter**

A non-resettable hour meter shall be installed and operated on each engine. [40 C.F.R. § 60.4209(a)]

4. **Annual Time Limit for Maintenance and Testing**

a. As emergency engines, the units shall each be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, 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). These limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours.

[40 C.F.R. § 60.4211(f) and 06-096 C.M.R. ch. 115, BPT]

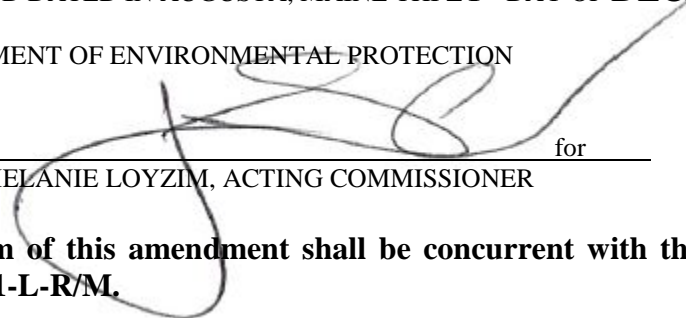
b. Unum shall keep records that include maintenance conducted on each engine and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the number of hours each unit operated for emergency purposes, the number of hours each unit operated for non-emergency purposes, and the reason each engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

5. Operation and Maintenance

The engines shall be operated and maintained according to the manufacturer's emission-related written instructions. Unum may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

DONE AND DATED IN AUGUSTA, MAINE THI 21st DAY OF DECEMBER, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for
MELANIE LOYZIM, ACTING COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-657-71-L-R/M.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 11/19/20

Date of application acceptance: 11/20/20

Date filed with the Board of Environmental Protection:

This Order prepared by Chris Ham, Bureau of Air Quality.

FILED
DEC 21, 2020
State of Maine
Board of Environmental Protection