



DEPARTMENT ORDER

**Portsmouth Naval Shipyard
 York County
 Kittery, Maine
 A-452-77-15-A**

**Departmental
 Findings of Fact and Order
 Air Emission License
 NSR #15**

FINDINGS OF FACT

After review of the air emission 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 (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Portsmouth Naval Shipyard (PNS)
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	336611 (Ship Building and Repairing)
NATURE OF BUSINESS	National Security (Submarine repair for U.S. Navy)
FACILITY LOCATION	Kittery, Maine

B. NSR License Description

Portsmouth Naval Shipyard (PNS) has requested a New Source Review (NSR) license for the installation of a 1,000-kW, distillate fuel-fired emergency generator.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Stationary Engine

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (kW)	Fuel Type, % sulfur	Firing Rate (gal/hr)	Date of Manuf.	Date of Install.	Stack #
Emergency Generator G42	9.85	1,000	Distillate fuel, 0.0015% S	71.9	2021	2021	132

D. 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.

E. 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 major source is considered a major or minor 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 (C.M.R.) ch. 100. For a major stationary source, the expected emissions increase from each new, modified, or affected unit may be calculated as equal to the difference between the post-modification projected actual emissions and the baseline actual emissions for each NSR regulated pollutant.

1. Baseline Actual Emissions

Baseline actual emissions (BAE) for existing affected emission units are equal to the average annual emissions from any consecutive 24-month period within the ten years prior to submittal of a complete license application. The selected 24-month baseline period can differ on a pollutant-by-pollutant basis. However, there are no existing emission units which are considered “affected” by this project.

The only equipment addressed by this NSR license is a new emission unit. Baseline actual emissions for new equipment are considered to be zero for all pollutants; therefore, the selection of a baseline year is unnecessary.

2. Projected Actual Emissions

New emission units must use potential to emit (PTE) emissions for projected actual emissions (PAE). Those emissions are presented in the following table.

Projected Actual Emissions

<u>Equipment</u>	<u>PM (tpv)</u>	<u>PM₁₀ (tpv)</u>	<u>PM_{2.5} (tpv)</u>	<u>SO₂ (tpv)</u>	<u>NO_x (tpv)</u>	<u>CO (tpv)</u>	<u>VOC (tpv)</u>
Emergency Generator G42	0.06	0.06	0.06	0.01	0.88	0.04	0.01
Total	0.06	0.06	0.06	0.01	0.88	0.04	0.01

3. Emissions Increases

Emissions increases are calculated by subtracting BAE from the PAE. Because there are no baseline emissions for new units, the emissions increases are equal to the PAE. The emission increase is then compared to the significant emissions increase levels.

<u>Pollutant</u>	<u>Projected Actual Emissions (ton/year)</u>	<u>Emissions Increase (ton/year)</u>	<u>Significant Emissions Increase Levels (ton/year)</u>
PM	0.06	+0.06	25
PM ₁₀	0.06	+0.06	15
PM _{2.5}	0.06	+0.06	10
SO ₂	0.01	+0.01	40
NO _x	0.88	+0.88	40
CO	0.04	+0.04	100
VOC	0.01	+0.01	40

4. Classification

Since emissions increases do not exceed significant emissions increase levels, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115.

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 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. Emergency Generator G42

PNS has requested to install and operate a distillate fuel-fired emergency generator. Emergency generators are generator sets with each gen set consisting of an engine and an electrical generator. The emergency generator was manufactured in 2021 and has an engine with a heat input capacity of 9.85 MMBtu/hr.

1. BACT Findings

a. Tier Review

As part of the BACT analysis, PNS investigated purchasing a Tier 4 engine instead of the Tier 2 engine proposed. As part of their analysis, PNS evaluated engine cost, pollutant reduction, and availability. In comparing costs, the Tier 2 engine totals approximately \$355,000, compared to approximately \$950,000 for a Tier 4 engine (\$595,000 difference). Because the EPA has not required the use of Tier 4 engines for engines of this size and larger, such an engine would have to be custom made with a significant wait time for the unit to be built. (At present, the manufacturer of the Tier 2 engine does not build Tier 4 engines of this size.) In addition, because of the unit's limited use of 100 hours per year of non-emergency operation, none of the criteria pollutants would be emitted in quantities greater than 1 ton per year; of these, the highest criteria pollutant being emitted would be NO_x at 0.7 tpy. A Tier 4 engine would reduce this by 0.66 tpy to 0.04 tpy of NO_x. Thus, the substantially higher cost of a Tier 4 engine, the lack of availability, and the small expected amount of emission reductions all result in a Tier 4 engine considered to be economically infeasible for NO_x (and the other pollutants which demonstrated even lower reductions with the Tier 4 engine).

b. Particulate Matter (PM PM₁₀, and PM_{2.5})

PM emissions from distillate fuel-fired engines are generally controlled through proper operation and maintenance. Additionally, this engine will be subject to 40 C.F.R. Part 60, Subpart III, and therefore required to meet EPA emission standards for emergency stationary engines as discussed below. Given the operating hours restrictions included in 40 C.F.R. Part 60, Subpart III, the use of add-on controls for PM is not economically feasible. BACT for PM emissions from

Emergency Generator G42 shall be proper operation and maintenance of the unit, installation of an EPA certified emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

c. Sulfur Dioxide (SO₂)

For emergency engines that fire distillate fuel and operate for only short periods of time, the use of wet scrubbers or other additional SO₂ add-on control methods would not be economically feasible considering the minimal emissions resulting from the limited use of the engines. The most practical method for limiting SO₂ emissions from such engines is the use of ultra-low sulfur fuel, such as distillate fuel with a sulfur content no greater than 0.0015% by weight. BACT for SO₂ emissions from Emergency Generator G42 shall be the use of distillate fuel with a sulfur content no greater than 0.0015% by weight, installation of an EPA certified emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

d. Nitrogen Oxides (NO_x)

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

SCR and NSCR are both post-combustion NO_x reduction technologies. SCR uses ammonia to react with NO_x in the gas stream in the presence of a catalyst to form nitrogen and water. NSCR uses a catalyst to convert CO, NO_x, and hydrocarbons into carbon dioxide, nitrogen, and water without the use of an additional reagent, and requires strict air-to-fuel control to maintain high reduction effectiveness without increasing hydrocarbon emissions. For an emergency back-up engine, neither SCR nor NSCR would be economically feasible considering the minimal emissions due to the limited use of the engine.

BACT for NO_x emissions from Emergency Generator G42 shall be the use of good combustion controls, proper operation and maintenance of the unit, installation of an EPA certified emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

e. 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 generators are generally controlled

through proper operation and maintenance of the units. Oxidation catalysts have been used on large generators to reduce CO and VOC emission levels in the exhaust, but, like SCR and NSCR, use of an oxidation catalyst on an emergency engine with limited yearly use would not provide a significant environmental benefit and would not be economically feasible. BACT for CO and VOC emissions from Emergency Generator G42 shall be proper operation and maintenance of the unit, installation of an EPA certified emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the tables below.

f. Visible Emissions

BACT for visible emissions from Emergency Generator G42 shall be the following:

Visible emissions from Emergency Generator G42 shall not exceed 20% opacity on a six-minute block average basis.

g. Fuel Use Restriction

The fuel fired in Emergency Generator G42 shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

h. Emission Limits

The BACT emission limits for Emergency Generator G42 are based on the following:

PM/PM₁₀/ - 0.12 lb/MMBtu from 06-096 C.M.R. ch. 103
PM₁₀
SO₂ - combustion of distillate fuel with a maximum sulfur content of 15 ppm (0.0015% sulfur by weight)
NO_x - 5.97 g/hp-hr based on manufacturer's data
CO - 0.24 g/hp-hr based on manufacturer's data
VOC - 0.03 g/hp-hr based on manufacturer's data
Visible Emissions - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for the generator are the following:

Unit	Pollutant	lb/MMBtu
Emergency Generator G42	PM	0.12

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator G42	1.18	1.18	1.18	0.02	17.65	0.71	0.09

2. 40 C.F.R. Part 60, Subpart IIII

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart IIII 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 IIII, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants 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 IIII requirements is listed below.

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart IIII, 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 IIII, 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.

[40 C.F.R. §§ 60.4211(f) and 60.4219]

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. PNS 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 IIII for emergency engines. [40 C.F.R. § 60.4214(b)]

(7) Recordkeeping

PNS shall keep records that include maintenance conducted on the engine and the hours of operation of the engine recorded through its 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. Incorporation Into the Part 70 Air Emission License

Per *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140 § 1(C)(8), for a modification at the facility that has undergone NSR requirements or been processed through 06-096 C.M.R. ch. 115, the source must apply for an amendment to their Part 70 license within one year of commencing the proposed operations, as provided in 40 C.F.R. Part 70.5. An application to incorporate the requirements of this NSR license into the Part 70 air emission license was submitted to the Department on May 3, 2021.

D. Annual Emissions

PNS is currently licensed with facility-wide limits of 2.26 billion cubic feet of natural gas per year and 4,900,0000 gallons of distillate fuel per year, both based on a 12-month rolling total. Neither of these limits nor the licensed annual emissions based on them will change as a result of the installation and operation of Emergency Generator G42.

III. AMBIENT AIR QUALITY ANALYSIS

PNS previously submitted an ambient air quality impact analysis outlined in air emission license A-452-70-A-I (dated March 1, 2000) demonstrating that emissions from the facility, in conjunction with all other sources, do not violate Ambient Air Quality Standards (AAQS). An additional air quality impact analysis is not required for this NSR license.

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 New Source Review License A-452-77-15-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the specific conditions below.

Severability. The invalidity or unenforceability of any provision of this License or part thereof 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) Emergency Generator G42

A. Emergency Generator G42 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations.
[06-096 C.M.R. ch. 115, BACT]

B. Fuel Use Restriction

The fuel fired in Emergency Generator G42 shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

C. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Emergency Generator G42	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)

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

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	PM _{2.5} (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator G42	1.18	1.18	1.18	0.02	17.65	0.71	0.09

E. Visible Emissions

Visible emissions from Emergency Generator G42 shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

F. Emergency Generator G42 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following:

1. Manufacturer Certification

The engine 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 engine 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, BACT]

3. Non-Resettable Hour Meter

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

4. 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).

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, BACT]

5. Operation and Maintenance

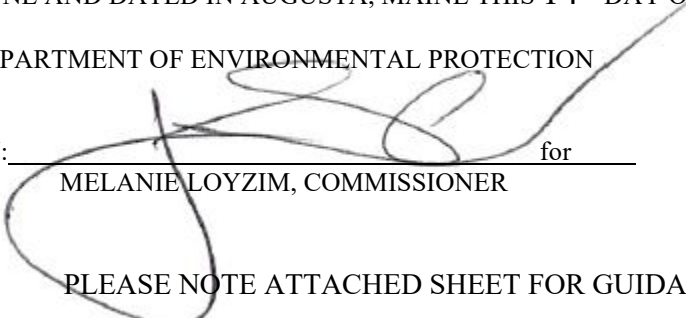
The engines shall be operated and maintained according to the manufacturer's emission-related written instructions. PNS may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

6. Recordkeeping

PNS shall keep records that include maintenance conducted on the engine and the hours of operation of the engine recorded through its 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)]

DONE AND DATED IN AUGUSTA, MAINE THIS 14th DAY OF JUNE, 2021.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for
MELANIE LOYZIM, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: May 3, 2021

Date of application acceptance: May 3, 2021

Date filed with the Board of Environmental Protection:

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

FILED
JUN 14, 2021
State of Maine
Board of Environmental Protection