



DEPARTMENT ORDER

Portsmouth Naval Shipyard  
York County  
Kittery, Maine  
A-452-77-17-A

Departmental  
Findings of Fact and Order  
New Source Review  
NSR #17

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 (the 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 two 350 kW Caterpillar C13 distillate-fired emergency generators (G44 and G45).

C. Emission Equipment

The following new equipment is addressed in this NSR license:

Generators/Engines

Equipment	Max. Heat Input Capacity (MMBtu/hr)	Max. Firing Rate (gal/hr)	Output	Fuel Type, % sulfur	Mfr. Date	Install. Date
G44, emergency generator	3.4	24.9	350 kW	Distillate Fuel, 0.0015%	2022	2022
G45, emergency generator	3.4	24.9	350 kW		2022	2022

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.

*Records* or *Logs* mean either hardcopy or electronic records.

E. Application Classification

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

The application for two Emergency Generators (G44 and G45) does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements.

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.

However, the only equipment addressed by this license are new emission units. Baseline actual emissions for new equipment are considered to be zero for all pollutants; therefore, the selection of a baseline period 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**

<b>Equipment</b>	<b>PM (tpy)</b>	<b>PM<sub>10</sub> (tpy)</b>	<b>PM<sub>2.5</sub> (tpy)</b>	<b>SO<sub>2</sub> (tpy)</b>	<b>NO<sub>x</sub> (tpy)</b>	<b>CO (tpy)</b>	<b>VOC (tpy)</b>
Emergency Generator, G44	0.02	0.02	0.02	0.01	0.75	0.16	0.06
Emergency Generator, G45	0.02	0.02	0.02	0.01	0.75	0.16	0.06
<b>Total</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.02</b>	<b>1.50</b>	<b>0.32</b>	<b>0.12</b>

3. Emissions Increases

Emissions increases are calculated by subtracting BAE from the PAE. The emissions increases are then compared to the significant emissions increase levels.

<b>Pollutant</b>	<b>Baseline Actual Emissions (ton/year)</b>	<b>Projected Actual Emissions (ton/year)</b>	<b>Emissions Increase (ton/year)</b>	<b>Significant Emissions Increase Levels (ton/year)</b>
PM	0	0.04	0.04	25
PM <sub>10</sub>	0	0.04	0.04	15
PM <sub>2.5</sub>	0	0.04	0.04	10
SO <sub>2</sub>	0	0.02	0.02	40
NO <sub>x</sub>	0	1.50	1.50	40
CO	0	0.32	0.32	100
VOC	0	0.12	0.12	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. PNS has submitted an application to incorporate the requirements of this NSR license into the facility's Part 70 air emission license.

## 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 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 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

### B. Emergency Generators G44 and G45

PNS has requested to install and operate two distillate fuel-fired emergency generators. Emergency generators are generator sets with each gen set consisting of an engine and an electrical generator. PNS continues to install emergency generators site-wide to provide redundancy and power reliability in the event of a power outage. Emergency Generator G44 will be installed to provide emergency backup power to the fire station housed in building B29 and is to be installed in summer of 2022. Emergency Generator G45 will provide emergency backup power to the control facility, B291, scheduled to be installed in the fall of 2022.

Each emergency generator is powered by a Tier 3 engine that was manufactured in 2022 and has a heat input capacity of 3.4 MMBtu/hr.

#### 1. BACT Findings

##### a. Particulate Matter (PM, PM<sub>10</sub>, and PM<sub>2.5</sub>)

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 Generators G44 and G45 shall be proper operation and maintenance of the unit, installation of an EPA certified Tier 3 emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

b. Sulfur Dioxide (SO<sub>2</sub>)

For emergency engines that fire distillate fuel and operate for only short periods of time, the use of wet scrubbers or other SO<sub>2</sub> 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 SO<sub>2</sub> 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 SO<sub>2</sub> emissions from Emergency Generators G44 and G45 shall be the use of distillate fuel with a sulfur content no greater than 0.0015% by weight, installation of an EPA certified Tier 3 emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

c. Nitrogen Oxides (NO<sub>x</sub>)

Potentially available control options for reducing emissions of NO<sub>x</sub> 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. The Tier 3 engine is equipped with electronic engine controls and is designed to minimize NO<sub>x</sub> emissions but does not include any after treatment devices for NO<sub>x</sub> control. Additional engine modifications such as injection systems or turbo charging systems are not economically feasible for an engine utilized as an emergency back-up engine.

SCR and NSCR are both post-combustion NO<sub>x</sub> reduction technologies. SCR uses ammonia to react with NO<sub>x</sub> in the gas stream in the presence of a catalyst to form nitrogen and water. NSCR uses a catalyst to convert CO, NO<sub>x</sub>, 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<sub>x</sub> emissions from Emergency Generators G44 and G45 shall be the use of good combustion controls, proper operation and maintenance of the unit, installation of an EPA certified Tier 3 emergency stationary engine as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the following tables.

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 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 Generators G44 and G45 shall be proper operation and maintenance of the units, installation of an EPA certified Tier 3 emergency stationary engines as required in 40 C.F.R. § 60.4205(b), and the emission limits listed in the tables below.

e. Visible Emissions

BACT for visible emissions from Emergency Generators G44 and G45 shall be as follows: Visible emissions from each unit to not exceed 20% opacity on a six-minute block average basis.

f. Fuel Use Restriction

The fuel fired in Emergency Generators G44 and G45 shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

g. Emission Limits

The BACT emission limits for Emergency Generators G44 and G45 are based on the following:

PM/PM <sub>10</sub>	- 0.12 lb/MMBtu from 06-096 C.M.R. ch. 103
SO <sub>2</sub>	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO <sub>x</sub>	- 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

The BACT emission limits for Emergency Generators G44 and G45 are the following:

Unit	Pollutant	lb/MMBtu
Emergency Generator G44	PM	0.12
Emergency Generator G45	PM	0.12

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	PM <sub>2.5</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator G44	0.41	0.41	0.41	0.01	15.04	3.24	1.19
Emergency Generator G45	0.41	0.41	0.41	0.01	15.04	3.24	1.19

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 engines listed above since the units were 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 units also meet 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;
- 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 engines 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 each 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 each engine. [40 C.F.R. § 60.4209(a)]

(4) Operation and Maintenance Requirements

Each 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 emergency engines, the units 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

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

(8) Enhanced Engine Operating Hours Monitoring and Recordkeeping

Per agreement with the Department and the EPA, PNS has agreed to the following additional measures to ensure their emergency engines do not operate more than allowed for by Subpart III in non-emergency service.

The enhanced monitoring shall include weekly inspections of all emergency engines. Inspections shall include recording the number of hours each emergency engine operated for emergency purposes, the number of hours each engine operated for non-emergency purposes, and the reason each engine was in operation during each time.

In addition to weekly inspections, emergency engines shall be inspected as soon as practicable, but not greater than 8 hours directly following each power outage for which the engine could operate. These inspections are being required to help minimize the amount of time an emergency engine may unintentionally operate following the end of a power outage and shall include the recording of the date/time the power was restored, the date/time of inspection, and whether the generator was running or not.

C. Incorporation Into the Part 70 Air Emission License

Pursuant to *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 has been submitted to the Department.

D. Annual Emissions

PNS is currently licensed with facility-wide limits of 2.26 billion cubic feet of natural gas per year and 4,900,000 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 Generators G44 and G45.

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

The Department hereby grants New Source Review License A-452-77-17-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 Generators G44 and G45**

- A. PNS is licensed to install and operate Emergency Generators G44 and G45, Tier 3 certified engines.
- B. Emergency Generators G44 and G45 shall each be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations.  
[06-096 C.M.R. ch. 115, BACT]
- C. Fuel Use Restriction

The fuel fired in Emergency Generators G44 and G45, shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

- D. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Emergency Generator, G44	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)
Emergency Generator, G45	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)

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

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	PM <sub>2.5</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator G44	0.41	0.41	0.41	0.01	15.04	3.24	1.19
Emergency Generator G45	0.41	0.41	0.41	0.01	15.04	3.24	1.19

F. Visible Emissions

Visible emissions from Emergency Generators G44 and G45 shall each not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

G. Emergency Generators G44 and G45 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following:

1. Manufacturer Certification

Each 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 each 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 each engine. [40 C.F.R. § 60.4209(a)]

4. Annual Time Limit for Maintenance and Testing

As an emergency engine, each 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 each engine and the hours of operation of each 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)]

H. Emergency Engines Enhanced Monitoring and Recordkeeping

The following shall apply to Emergency Generators G44 and G45:

1. Inspections of all emergency engines shall be conducted on a weekly basis.
2. Inspections shall entail the same recordkeeping requirements as required by Subpart IIII. PNS shall record the number of hours each engine operated for emergency purposes, the number of hours the engine operated for non-emergency purposes, and the reason each engine was in operation during each time.

3. In addition to weekly inspections, emergency engines shall be inspected as soon as practicable, but not greater than 8 hours directly following each power outage for which the engine could operate. These inspections are being required to help minimize the amount of time an emergency engine may unintentionally operate following the end of a power outage and shall include recording of the date/time the power was restored, the date/time of inspection, and whether the generator was running or not.

DONE AND DATED IN AUGUSTA, MAINE THIS 6<sup>th</sup> DAY OF May, 2022.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for  
MELANIE LOYZIM, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: February 8, 2022

Date of application acceptance: February 16, 2022

Date filed with the Board of Environmental Protection:

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

**FILED**  
MAY 06, 2022  
State of Maine  
Board of Environmental Protection