STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Portsmouth Naval Shipyard **York County** **Kittery, Maine** **A-452-77-9-A**	**Departmental** **Findings of Fact and Order** **New Source Review** **NSR #9**

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 Ship Repair)
NATURE OF BUSINESS	National Security (Submarine repair for U.S. Navy)
FACILITY LOCATION	Kittery, Maine

B. NSR License Description

Portsmouth Naval Shipyard (PNS, the Shipyard) has requested a New Source Review (NSR) license for the installation of one new 60 kW emergency generator and one new 1.1 MW emergency turbine generator.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Generators/Turbines

Equipment	Max. Heat Input Capacity (MMBtu/hr)	Max. Firing Rate (gal/hr)	Output	Fuel Type, % sulfur	Mfr. Date	Install. Date
MUSE-TG1	13.5	103	1.1 MW	Distillate fuel, 0.0015%	2017	2017
Emergency Generator G28	0.64	4.6	60 kW		2015	2017

D. Definitions

Distillate Fuel. For the purposes of this license, *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.

Emergency Combustion Turbine. For the purposes of this license and in accordance with 40 C.F.R. Part 60, Subpart KKKK, *emergency combustion turbine* means any stationary combustion turbine which operates in an emergency situation. Examples include stationary combustion turbines used to produce power for critical networks or equipment, including power supplied to portions of a facility, when electric power from the local utility is interrupted, or stationary combustion turbines used to pump water in the case of fire or flood, etc. Emergency stationary combustion turbines do not include stationary combustion turbines used as peaking units at electric utilities or stationary combustion turbines at industrial facilities that typically operate at low capacity factors. Emergency combustion turbines may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are required by the manufacturer, the vendor, or the insurance company associated with the turbine. Required testing of such units should be minimized, but there is no time limit on the use of such units in emergency situations.

Stationary Combustion Turbine. For the purposes of this license and in accordance with 40 C.F.R. Part 60, Subpart KKKK, *Stationary combustion turbine* means all equipment, including but not limited to the turbine, the fuel, air, lubrication, and exhaust gas systems, control systems (except emissions control equipment), heat recovery system, and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine, any combined cycle combustion turbine, and any combined heat and power combustion turbine based system. Stationary means that the combustion turbine is not self-propelled or intended to be propelled while performing its function. It may, however, be mounted on a vehicle for portability.

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 the addition of Emergency Generator G28 and MUSE-TG1 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.

Pollutant	Projected Actual Emissions for Emergency Generator G28 and MUSE-TG1* (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	0.17	25
PM_{10}	0.17	15
$PM_{2.5}$**	0.18	10
SO_2	0.01	40
NO_x	1.38	40
CO	0.03	100
VOC	0.01	40
CO_2e***	240	75,000

*Based on non-emergency operating hours restrictions of 100 hours/year for Emergency Generator G28 and 200 hours/year for MUSE-TG1

**Upon review of available emission factors for condensable $PM_{2.5}$, EPA's AP-42 Table 1.3-2 (5/2010) identifies a condensable $PM_{2.5}$ emission factor of 1.3 lb/1000 gallons for distillate fuel fired in external combustion sources. AP-42 identifies no emission factor for condensable $PM_{2.5}$ for internal combustion sources such as these units. Estimating both filterable and condensable $PM_{2.5}$ emissions from the new, distillate fuel-fired Emergency Generator G28 and MUSE-TG1 assuming all filterable PM is $PM_{2.5}$ and using this emission factor to quantify condensable $PM_{2.5}$, the total is 0.18 ton/year, well below the significant emissions increase level for $PM_{2.5}$.

Secondary formation of $PM_{2.5}$ due to the precursor emissions of NO_x and SO_2 are considered in Table III-1 of "*Guidance for PM2.5 Permit Modeling*" (USEPA, 2014), which presents Significant Emission Rate (SER) values for primary $PM_{2.5}$ as well as for precursor pollutants. Since the proposed increases for this modification are well below the identified SERs for direct $PM_{2.5}$, NO_x, and SO_2, the Department considers secondary formation of $PM_{2.5}$ does not contribute appreciably to the total. The Department concludes that this modification is not major for $PM_{2.5}$, and this pollutant will not be addressed further in this license.

***Carbon dioxide equivalents

The above values are for Emergency Generator G28 and MUSE-TG1 only. None of the other equipment at the facility is affected by this NSR license. Therefore, 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 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 to the Department.

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 Generator G28

PNS has requested approval to install a new emergency generator, Emergency Generator G28, at the facility. The new emergency generator is a genset consisting of a John Deere Model 4045TF280 engine and a Blue Star Power Systems Inc. electrical generator. Emergency Generator G28 is rated for an output of 60 kW (0.64 MMBtu/hr input) and fires distillate fuel. Emergency Generator G28 was manufactured in 2015 and will be installed at the facility in late 2017.

Emergency Generator G28 will meet the following state and federal regulations as described below.

1. BACT Findings

a. Particulate Matter (PM & PM_{10})

Particulate matter 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 IIII, which means it will be required to meet EPA emission standards for emergency stationary engines as discussed below. Given the small size of the unit (0.64 MMBtu/hr) and the operating hours restriction included in 40 C.F.R. Part 60, Subpart IIII, additional control for particulate matter is not economically feasible. BACT for PM/PM_{10} emissions from Emergency Generator G28 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 an emission limit of 0.08 lb/hr.

b. Sulfur Dioxide (SO_2)

For an emergency engine that fires distillate fuel and operates for only short periods of time, the use of wet scrubbers or other additional SO_2 add-on control methods would not be economically feasible considering the minimal emissions due to the limited use of the engine. The most practical method for limiting SO_2 emissions of such an engine is the use of low sulfur fuel, such as distillate fuel with a sulfur content no greater than 0.0015% by weight. BACT for SO_2 emissions from Emergency Generator G28 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 an emission limit of 0.01 lb/hr.

c. Nitrogen Oxides (NO_x)

Potentially available control options for reducing emissions of NO_x from distillate fuel-fired generators 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. Most new engines are designed with these features as standard equipment.

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 a unit of this size (0.64 MMBtu/hr) and usage (emergency back-up engine), neither SCR nor NSCR would be 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 Emergency Generator G28 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 an emission limit of 2.82 lb/hr.

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. 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 such a small 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 G28 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 emission limits of 0.61 lb/hr for CO and 0.22 lb/hr for VOC.

e. Greenhouse Gases (GHG)

Emissions of greenhouse gases from small emergency engines are minimized through proper operation and maintenance of the unit and maintaining the unit's efficiency. There are no specific GHG emission requirements for Emergency Generator G28 at this time.

f. Visible Emissions

BACT for visible emissions from Emergency Generator G28 shall be the following:

Visible emissions from Emergency Generator G28 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

(1) The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
(2) The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;
(3) The unit operator shall minimize the engine's time spent at idle 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 apply; and
(4) The unit, including any associated air pollution control equipment, shall be operated 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.

g. Fuel Use Restriction

The fuel fired in Emergency Generator G28 shall also be included in the facility's distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

2. Emission Limits

The BACT emission limits for Emergency Generator G28 are based on the following:

PM/PM_{10}	- 0.12 lb/MMBtu from 06-096 C.M.R. ch. 115, BACT
SO_2	- 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, Table 3.3-1, dated 10/96
CO	- 0.95 lb/MMBtu from AP-42, Table 3.3-1, dated 10/96
VOC	- 0.35 lb/MMBtu from AP-42, Table 3.3-1, dated 10/96
Visible Emissions	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Emergency Generator G28 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)
Emergency Generator G28	0.08	0.08	0.01	2.82	0.61	0.22

Visible emissions from Emergency Generator G28 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

a. The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
b. The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;
c. The unit operator shall minimize the engine's time spent at idle 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 apply; and
d. The unit, including any associated air pollution control equipment, shall be operated 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.

3. Periodic Monitoring

The fuel used in Emergency Generator G28 shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year based on a 12-month rolling total. Compliance shall be demonstrated by records of total distillate fuel use kept on a monthly and 12-month rolling total basis.

4. 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 Emergency Generator G28 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. 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 IIII 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), except that any existing fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted. [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 or procedures developed by PNS that are approved by the engine manufacturer. 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 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. MUSE-TG1 (Emergency Turbine Generator)

PNS has requested approval to install a new emergency turbine generator, MUSE-TG1, at the facility. MUSE-TG1 was manufactured by Turbine Marine Inc. and will fire distillate fuel at a maximum rate of 103 gallons/hour. MUSE-TG1 has a maximum power output of 1.1 MW, was manufactured in 2017, and will be installed at the facility in late 2017.

1. BACT Findings

a. Particulate Matter (PM & PM_{10})

Particulate matter (PM) emissions from distillate fuel-fired combustion turbines are typically controlled through proper operation and maintenance. Based on the size of the unit (13.5 MMBtu/hr), the intended usage of the unit as an emergency combustion turbine as defined in 40 C.F.R. Part 60, Subpart KKKK, and the low ash content of distillate fuel, additional control for particulate matter is not economically feasible. BACT for PM/PM_{10} emissions from MUSE-TG1 shall be

proper operation and maintenance of the unit, and emission limits of 1.08 lb/hr and 0.08 lb/MMBtu.

b. Sulfur Dioxide (SO_2)

Sulfur Dioxide (SO_2) emissions from distillate fuel-fired combustion turbines are directly related to the sulfur content of the fuel. Control methods for SO_2 include the use of lower sulfur fuels and post-combustion technologies such as wet scrubbing and flue gas desulfurization. The most practical method for limiting SO_2 emissions from distillate fuel-fired combustion turbines is the use of ultra-low sulfur fuel, such as distillate fuel with a sulfur content no greater than 0.0015% by weight (15 ppm), as PNS has proposed. Based on the limited use of the unit as an emergency combustion turbine and the use of an ultra-low sulfur fuel, additional add-on control methods such as those mentioned above would not be economically feasible. BACT for SO_2 emissions from MUSE-TG1 shall be the use of distillate fuel with a sulfur content no greater than 0.0015% by weight, and an emission limit of 0.02 lb/hr.

c. Nitrogen Oxides (NO_x)

Nitrogen oxides (NO_x) formation occurs by three mechanisms. The first is thermal NO_x, which arises from the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. The second is prompt NO_x, which is formed from early reactions of nitrogen molecules in the combustion air with hydrocarbon radicals from the fuel and is usually negligible compared to the amount of thermal NO_x formed. The third is fuel NO_x, which stems from the reaction of fuel-bound nitrogen compounds with oxygen in the combustion air. For distillate fuel-fired combustion turbines, thermal NO_x is generally the predominant NO_x formation mechanism, except in units with a high degree of thermal NO_x controls where fuel NO_x may become significant.

Potentially available control options for reducing NO_x emissions from distillate fuel-fired combustion turbines include combustion controls, which are typically implemented through design features such as electronic engine controls, injections systems, combustion chamber geometry, and turbocharging systems, wet controls, which use steam or water injection to reduce combustion temperatures, dry low NO_x combustors that use advanced combustor design to suppress NO_x formation, and post-combustion catalytic control technologies such as selective catalytic reduction (SCR) systems which selectively reduce NO_x emissions by injecting ammonia into the exhaust gas stream upstream of a catalyst, where nitrogen oxides, ammonia, and oxygen react on the surface of the catalyst to form N_2 and H_2O.

Based on the small size of the unit (1.1 MW) compared to other combustion turbines and the limited use of the unit as an emergency combustion turbine, additional add-on control methods such as those mentioned above would not be economically feasible. BACT for NO_x emissions from MUSE-TG1 shall be the use of good combustion controls, proper operation and maintenance of the unit, and an emission limit of 11.88 lb/hr.

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, limited oxygen availability, or incomplete mixing to complete the final step in fuel carbon oxidation. CO and VOC emissions from distillate fuel-fired combustion turbines are generally controlled through proper operation and maintenance. Add-on controls for CO and VOC such as oxidation catalysts are available, but would not be economically feasible given the limited use of the unit as an emergency combustion turbine and the lack of significant environmental benefit.

BACT for CO and VOC emissions from MUSE-TG1 shall be proper operation and maintenance of the unit, and emission limits of 0.04 lb/hr and 0.01 lb/hr for CO and VOC, respectively.

e. Greenhouse Gases (GHG)

GHG emissions from small to medium size emergency turbine generators are minimized through proper operation and maintenance of the unit and maintaining the unit's efficiency. There are no specific GHG emission limits required for MUSE-TG1 at this time.

f. Visible Emissions

BACT for visible emissions from MUSE-TG1 shall be the following:

Visible emissions from MUSE-TG1 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

(1) The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
(2) The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;

(3) The unit operator shall minimize the engine's time spent at idle 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 apply; and

(4) The unit, including any associated air pollution control equipment, shall be operated 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.

g. Fuel Use Restriction

Fuel fired in MUSE-TG1 shall be included in the facility-wide distillate fuel limit of 4,900,000 gallons/year, based on a 12-month rolling total.

h. Operating Hours Restriction

Although not included in the definition of *Emergency Combustion Turbine* included in 40 C.F.R. Part 60, Subpart KKKK, the Department has determined that BACT for MUSE-TG1 shall be a conservative non-emergency operating hours restriction of 200 hours/year for the purpose of maintenance checks and readiness testing. This limit has also been used to calculate the projected actual emissions for MUSE-TG1 included in the application classification section of this air emission license.

2. Emission Limits

The BACT emission limits for MUSE-TG1 are based on the following:

PM/PM_{10}	- 0.08 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
SO_2	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO_x	- 0.88 lb/MMBtu from AP-42, Table 3.1-1, dated 4/00
CO	- 0.0033 lb/MMBtu from AP-42, Table 3.1-1, dated 4/00
VOC	- 0.00041 lb/MMBtu from AP-42, Table 3.1-2a, dated 4/00
Visible Emissions	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for MUSE-TG1 are the following:

Unit	Pollutant	lb/MMBtu
MUSE-TG1	PM	0.08

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
MUSE-TG1	1.08	1.08	0.02	11.88	0.04	0.01

Visible emissions from MUSE-TG1 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

a. The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
b. The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;
c. The unit operator shall minimize the engine's time spent at idle 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 apply; and
d. The unit, including any associated air pollution control equipment, shall be operated 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.

3. Periodic Monitoring

The fuel used in MUSE-TG1 shall be included in the facility's distillate fuel limit of 4,900,000 gallons/year based on a 12-month rolling total. Compliance shall be demonstrated by records of total distillate fuel use kept on a monthly and 12-month rolling total basis.

The sulfur content of the distillate fuel fired in MUSE-TG1 shall not exceed 0.0015% sulfur by weight (15 ppm). Compliance shall be demonstrated by fuel records from the supplier showing the type and percent sulfur of the fuel delivered.

Additionally, PNS shall maintain records of the total hours of operation for the unit. These records shall include the amount of time the unit operated, the date of operation, and the reason for operating. These records shall be used to demonstrate compliance

with the 200 hours/year non-emergency operating hours limit and to demonstrate that the unit is operated according to the definition of *Emergency Combustion Turbine* as defined in 40 C.F.R. Part 60, Subpart KKKK.

4. *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart IIII

   Emergency turbine generator MUSE-TG1 is not subject to *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart IIII. MUSE-TG1 is not a stationary internal combustion engine as defined in 40 C.F.R. Part 60, Subpart IIII.

5. *Standards of Performance for Stationary Combustion Turbines*, 40 C.F.R. Part 60, Subpart KKKK

   Emergency turbine generator MUSE-TG1 is subject to *Standards of Performance for Stationary Combustion Turbines*, 40 C.F.R. Part 60, Subpart KKKK. The unit is considered a stationary emergency combustion turbine with a heat input at peak load greater than 10 MMBtu/hr which commenced construction after February 18, 2005. [40 C.F.R. §§ 60.4305(a) and 60.4420] The requirements of 40 C.F.R. Part 60, Subpart KKKK applicable to emergency turbine generator MUSE-TG1 are included below:

   a. Work Practice Standards

      (1) In order for MUSE-TG1 to be considered an emergency combustion turbine and therefore exempt from the NO_x emission limits in this subpart, PNS shall operate the unit according to the definition of *emergency combustion turbine* in 40 C.F.R. § 60.4420. [40 C.F.R. §§ 60.4420 and 60.4310(a)]

      (2) PNS shall operate and maintain MUSE-TG1 and any associated air pollution control and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction. [40 C.F.R. § 60.4333(a)]

   b. Emission Limits

      (1) PNS shall not burn any fuel in MUSE-TG1 which contains total potential sulfur emissions in excess of 0.06 lb SO_2/MMBtu of heat input. This requirement has been streamlined to the BACT fuel sulfur content limit of 15 ppm (0.0015% sulfur by weight, approximately 0.0015 lb SO_2/MMBtu). [40 C.F.R. § 60.4330(a) and 06-096 C.M.R. ch. 115, BACT]

(2) In order to demonstrate compliance with the sulfur limit included in 40 C.F.R. § 60.4330(a), PNS shall demonstrate that the fuel fired in MUSE-TG1 does not exceed potential sulfur emissions of 0.06 lb SO_2/MMBtu heat input using fuel quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the fuel, which specifies that the maximum total sulfur content for the fuel is 0.0015 weight percent (15 ppmw) or less. [40 C.F.R. §§ 60.4360 and 60.4365(a)]

c. Notifications and Reports

PNS shall submit an initial report to EPA and the Department stating the facility's case, which shall be a justification explaining how the unit meets the definition of *emergency combustion turbine* as defined in 40 C.F.R. § 60.4420. This report must be postmarked by the 30th day following startup of the unit. [40 C.F.R. §§ 60.4390(a) & 06-096 C.M.R. ch. 115, BACT]

D. Incorporation Into the Part 70 Air Emission License

The requirements in this 06-096 C.M.R. ch. 115 New Source Review license shall apply to the facility upon issuance. 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. PNS submitted an application to incorporate the requirements of this New Source Review license into their Part 70 license on October 4, 2017.

E. Facility Annual Emissions and Fuel Use Cap

PNS is currently licensed to a facility-wide limit of 2.26 billion cubic feet of natural gas and 4,900,000 gallons of distillate fuel, based on a 12-month rolling total. Neither these limits nor the licensed annual emissions based on them will change as a result of the installation of the new emergency generator and emergency turbine generator.

III. AMBIENT AIR QUALITY ANALYSIS

PNS previously submitted an ambient air quality analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards (see license A-452-70-A-I, issued March 1, 2000). An additional ambient air quality 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-452-77-9-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 G28

A. Emergency Generator G28 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 C.M.R. ch. 115, BPT]

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

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator G28	0.08	0.08	0.01	2.82	0.61	0.22

C. Visible emissions from Emergency Generator G28 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

1. The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
2. The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;

3. The unit operator shall minimize the engine's time spent at idle 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 apply; and
4. The unit, including any associated air pollution control equipment, shall be operated 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.

[06-096 C.M.R. ch. 115, BACT]

D. Emergency Generator G28 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), except that any existing fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted. Compliance with the fuel sulfur content limit shall be based on fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. [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
   a. 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]

b. PNS 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)]

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

(2) MUSE-TG1 (Emergency Turbine Generator)

A. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
MUSE-TG1	PM	0.08	06-096 C.M.R. ch. 115, BACT

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

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
MUSE-TG1	1.08	1.08	0.02	11.88	0.04	0.01

C. Visible emissions from MUSE-TG1 shall not exceed 20% opacity on a six-minute block average basis, except for no more than one six-minute block average in a one-hour period to accommodate periods of startup and load changes. During such periods, the facility shall comply with the following work practice standards:

1. The unit operator shall maintain a log (written or electronic) of the date, time, and duration of all unit startups;
2. The unit shall be operated in accordance with the manufacturer's emission-related operating instructions;
3. The unit operator shall minimize the engine's time spent at idle 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 apply; and

4. The unit, including any associated air pollution control equipment, shall be operated 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.

[06-096 C.M.R. ch. 115, BACT]

D. The distillate fuel fired in MUSE-TG1 shall not exceed a maximum sulfur content of 0.0015% by weight (15 ppm). Sulfur content compliance shall be demonstrated by fuel delivery receipts from the supplier indicating the type and percent sulfur of the fuel delivered. [06-096 C.M.R. ch. 115, BACT]

E. Operating Hours Restriction

1. MUSE-TG1 shall be limited to 200 hours/year of non-emergency operation for the purposes of maintenance checks and readiness testing. [06-096 C.M.R. ch. 115, BPT]
2. In order to document compliance with the above limit and to demonstrate the unit is being operated according to the definition of *emergency combustion turbine* as established in 40 C.F.R. Part 60, Subpart KKKK, PNS shall maintain records of the total hours of operation for the unit. These records shall include the amount of time the unit operated, the date of operation, and the reason for operating. [06-096 C.M.R. ch. 115, BPT]

F. MUSE-TG1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart KKKK, including the following:

1. Work Practice Standards

a. In order for MUSE-TG1 to be considered an emergency combustion turbine and exempt from the NO_x emission limits in this subpart, PNS shall operate the unit according to the definition of emergency combustion turbine in 40 C.F.R. § 60.4420. [40 C.F.R. §§ 60.4420 and 60.4310(a)]

b. PNS shall operate and maintain MUSE-TG1 and any associated air pollution control and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction. [40 C.F.R. § 60.4333(a)]

2. Emission Limits

   a. PNS shall not burn any fuel in MUSE-TG1 which contains total potential sulfur emissions in excess of 0.06 lb SO_2/MMBtu of heat input. This requirement has been streamlined to the BACT fuel sulfur content limit of 15 ppm (0.0015% sulfur by weight, approximately 0.0015 lb SO_2/MMBtu). [40 C.F.R. § 60.4330(a) and 06-096 C.M.R. ch. 115, BACT]

   b. In order to demonstrate compliance with the sulfur limit included in 40 C.F.R. § 60.4330(a), PNS shall demonstrate that the fuel fired in MUSE-TG1 does not exceed potential sulfur emissions of 0.06 lb SO2/MMBtu heat input using fuel quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the fuel, which specifies that the maximum total sulfur content for the fuel is 0.0015 weight percent (15 ppmw) or less. [40 C.F.R. §§ 60.4360 and 60.4365(a)]

3. Notifications and Reports

   PNS shall submit an initial report to EPA and the Department stating the facility's case, which shall be a justification explaining how the unit meets the definition of an emergency combustion turbine as defined in 40 C.F.R. § 60.4420. This report must be postmarked by the 30th day following startup of the unit. [40 C.F.R. §§ 60.4390(a) & 06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 27 DAY OF December , 2017.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 10/4/2017
Date of application acceptance: 10/5/2017

Date filed with the Board of Environmental Protection:

Filed
DEC 27 2017
State of Maine
Board of Environmental Protection

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.