



DEPARTMENT ORDER

Maine Army National Guard
Penobscot County
Bangor, Maine
A-755-71-K-A (SM)

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

FINDINGS OF FACT

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

I. REGISTRATION

A. Introduction

Maine Army National Guard (MEARNG) was issued Air Emission License A-755-71-I-R/A on July 8, 2014, for the operation of emission sources associated with their facilities. The license was subsequently amended on March 3, 2017 (A-755-71-J-A).

MEARNG has requested an amendment to their license in order to replace several dual-fired boilers with gas-condensing, newer, more efficient dual-fired boilers or Combined Heat Power (CHP) units.

The equipment addressed in this license amendment is located at various facilities in the vicinity of the Bangor International Airport in Bangor, Maine.

B. Emission Equipment

The following equipment is being added to the facility's air emission license through this amendment:

Boilers

Equipment	Max. Capacity (MMBtu/hr)	Fuel Type, % sulfur	Maximum Firing Rate	Date of Manuf.	Date of Install.	Stack #
Boiler 260-5	3.0	Natural Gas, negl.	2941 scfh	2017	2018	260-E
Boiler 260-6	3.0	Natural Gas, negl.	2941 scfh	2017	2018	260-F
Boiler 260-7	4.0	Distillate Fuel, 0.5%	28.6 gph	2017	2018	260-G
		Natural Gas, negl.	3922 scfh			

The following equipment is being removed from service by MEARNG.

Fuel Burning Equipment Being Removed

Equipment	Max. Capacity (MMBtu/hr)	Fuel Type, % sulfur	Maximum Firing Rate	Date of Manuf.	Stack #
Boiler 260-2	4.40	Distillate Fuel, 0.5%	30.5 gph	2002	260-B
		Natural Gas, negl.	4404 scfh		
Boiler 260-3	4.40	Distillate Fuel, 0.5%	30.5 gph	2002	260-C
		Natural Gas, negl.	4404.scfh		
Boiler 260-4	4.40	Distillate Fuel, 0.5%	30.5 gph	2002	260-D
		Natural Gas, negl.	4404 scfh		
AFRC-1	4.55	Distillate Fuel, 0.5%	32.5 gph	1996	AFRC-A
AFRC-2	4.55	Distillate Fuel, 0.5%	32.5 gph	1998	AFRC-B

Fuel Storage Tank Being Removed

Equipment	Capacity (gallons)	Material Stored	Tank Type	Tank Size, (L x Dia) in feet	Year Installed
Tank 11 (AFRC Building)	12,000	Distillate Fuel	Single wall steel with secondary containment	32 x 8	1990

Additionally, MEARNG also plans to install additional new fuel burning equipment at their Bangor facilities that is considered insignificant by rule based on their sizes. This new equipment is being listed below for purposes of completeness only, and will not be addressed further in this license amendment. [06-096 C.M.R. ch. 115, Appendix B, (B)(2) and (3)]

Insignificant Fuel Burning Equipment to be Installed

Equipment	Max. Capacity (MMBtu/hr)	Fuel Type, % sulfur	Maximum Firing Rate	Date of Manuf.	Date of Install.	Stack #
Boiler AFRC-3	0.75	Natural Gas, negl.	737 scfh	2017	2018	AFRC-D
Boiler AFRC-4	0.75	Natural Gas, negl.	737 scfh	2017	2018	AFRC-E
Makeup Air Unit	0.37	Natural Gas, negl.	367scfh	2017	2018	AFRC-F
CoGen Unit	0.38	Natural Gas, negl.	368 scfh	2017	2018	AFRC-G

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

The current air license has an annual heat input restriction of 35,000 MMBtu per year for the boilers at MEARNG. This restriction will remain in place and shall apply to the facility after the obsolete equipment affected by this amendment has been removed and the new equipment has been installed. The pollutant emission factors for the new equipment being installed are lower than or equal to those for the obsolete equipment being removed. As a result, this amendment will not result in any increase to the facility’s potential to emit or their licensed annual emissions.

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

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

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

B. Boilers 260-5, 260-6 and 260-7

MEARNG proposes to install Boilers 260-5, 260-6 and 260-7 within their Building 260 for heating purposes. The boilers are rated at 3.0 MMBtu/hr, 3.0 MMBtu/hr and 4.0 MMBtu/hr respectively. Boilers 260-5 and 260-6 will fire natural gas exclusively, while Boiler 260-7 will be capable of firing either natural gas or distillate fuel. The boilers are scheduled to be installed in 2018 and each will exhaust through its own stack.

1. BACT Findings for Boilers 260-5, 260-6 and 260-7

a. Particulate Matter: PM / PM₁₀

Particulate matter emissions from natural gas-fired and distillate fuel-fired boilers of this size are generally controlled through their proper operation and maintenance and by using good combustion practices. The Department finds that BACT for PM / PM₁₀ emissions from Boilers 260-5, 260-6 and 260-7 shall be the firing of natural gas and/or low sulfur distillate fuel, the use of good combustion practices and the proper operation and maintenance of the boilers.

b. Sulfur Dioxide: SO₂

SO₂ emissions from boilers are directly related to the quantity of the fuel being fired and its sulfur content. Boilers 260-5 and 260-6 will fire natural gas exclusively, which is inherently low in sulfur content. Therefore, the BACT for SO₂ for natural gas-fired Boilers 260-5 and 260-6 is to only fire natural gas in them and to properly operate and maintain the units.

Boiler 260-7 is a dual fuel-fired boiler that will be capable of firing both natural gas and distillate fuel. The BACT for SO₂ for Boiler 260-7 when firing natural gas is to properly operate and maintain the unit.

BACT for SO₂ emissions from distillate fuel-fired boilers can include add-on controls. However, for smaller distillate fuel-fired boilers like 260-7, the most practical method for limiting SO₂ emissions is through the use of low sulfur fuel having a sulfur content of no greater than 0.5% by weight.

Boiler 260-7 is licensed to fire distillate fuel which, by definition, has a sulfur content of 0.5% or less by weight. Per 38 M.R.S. § 603-A(2)(A)(3), as of July 1, 2018, no person shall import, distribute, or offer for sale any distillate fuel

with a sulfur content greater than 0.0015% by weight (15 ppm). Therefore, beginning July 1, 2018, the distillate fuel purchased or otherwise obtained for use in Boiler 260-7 shall not exceed 0.0015% by weight (15 ppm). This is consistent with the requirements found in Air Emission License A-755-71-I-R/A (July 18, 2014), and Air Emission License A-755-71-J-A (March 3, 2017).

Boiler 260-7's small size and the amount of emissions that will be generated by this unit while firing low sulfur distillate fuel makes the use of add-on controls economically unfeasible. Therefore, the Department finds that prior to July 1, 2018 BACT for SO₂ emissions from Boiler 260-7 when firing distillate fuel shall be the firing of fuel with a maximum sulfur content of 0.5% by weight, and the proper operation and maintenance of the units. After July 1, 2018, BACT for SO₂ emissions from Boiler 260-7 when firing distillate fuel shall be the firing of fuel having a maximum sulfur content of 0.0015% by weight, and the proper operation and maintenance of the units. Any distillate fuel obtained by MEARNG prior to July 1, 2018 that has a maximum sulfur content of 0.5% by weight may be fired in Boiler 260-7 after July 1, 2018 until it has been depleted.

c. Nitrogen Oxides: NO_x

Potentially available control options for reducing NO_x emissions from natural gas-fired and distillate fuel-fired boilers include low NO_x burners, selective catalytic reduction (SCR), and non-selective catalytic reduction (NSCR). Combustion controls such as flue gas recirculation and the utilization of low NO_x burners can be integrated in the design of the boiler features, while SCR and NSCR are add-ons that can require significant investment and space for installation.

By design, Boilers 260-5, 260-6 and 260-7 all are rated to emit less than 30 ppm of NO_x, based on a 3% O₂ correction. The Department finds that no further controls are required for NO_x emissions based on the sizes of the boilers and their inherently low NO_x output and that BACT for NO_x emissions from Boilers 260-5, 260-6 and 260-7 shall be the proper operation and maintenance of the boilers in conjunction with implementation of good combustion controls.

d. Carbon Monoxide and Volatile Organic Compounds: CO and VOC

CO and VOC emissions result from incomplete fuel combustion, caused by conditions such as insufficient residence time or limited oxygen availability in the boiler. CO and VOC emissions from natural gas-fired and distillate fuel-fired boilers of this size are generally managed through good combustion controls and proper operation and maintenance of the units.

Based on their sizes and their relatively low emission rates, the Department finds that BACT for CO and VOC emissions from Boilers 260-5, 260-6 and 260-7 shall be the proper operation and maintenance of these units.

2. Emission Limits

The BACT emission limits for Boilers 260-5, 260-6 and 260-7 when firing natural gas were based on the following:

Natural Gas

<u>Pollutant</u>	<u>Emission Rate</u>
PM, PM ₁₀	- 0.05 lb/MMBtu, based on 06-096 C.M.R. ch. 115, BACT
SO ₂	- 0.6 lb/MMscf, based on AP-42 Table 1.4-2 (07/98)
NO _x	- 50 lb/MMscf, based on AP-42 Table 1.4-2 (07/98)
CO	- 84 lb/MMscf, based on AP-42 Table 1.4-2 (07/98)
VOC	- 5.5 lb/MMscf, based on AP-42 Table 1.4-2 (07/98)

The BACT emission limits for Boiler 260-7 when firing distillate fuel were based on the following:

Distillate Fuel

<u>Pollutant</u>	<u>Emission Rate</u>
PM, PM ₁₀	- 0.08 lb/MMBtu, 06-096 C.M.R. ch. 115, BACT
SO ₂	- 0.5 lb/MMBtu, based on firing ASTM D396 compliant distillate fuel (0.5% sulfur by weight)
NO _x	- 20 lb/10 ³ gal, based on AP-42 Table 1.3-1 (05/10)
CO	- 5 lb/10 ³ gal, based on AP-42 Table 1.3-1 (05/10)
VOC	- 0.34 lb/10 ³ gal, based on AP-42 Table 1.3-3 (05/10)

The BACT emission limits for boilers 260-5, 260-6 and 260-7 when firing natural gas are the following:

<u>Unit</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>
Boilers 260-5, 260-6 and 260-7	PM	0.05

The BACT emission limit for boiler 260-7 when firing distillate fuel is the following:

Unit	Pollutant	lb/MMBtu
Boiler 260-7	PM	0.08

The emission limits for Boilers 260-5, 260-6 and 260-7 are the following:

Unit	Fuel	PM (lb/hr)	PM₁₀ (lb/hr)	SO₂ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler 260-5	Natural Gas	0.15	0.15	0.01	0.15	0.25	0.02
Boiler 260-6	Natural Gas	0.15	0.15	0.01	0.15	0.25	0.02
Boiler 260-7	Natural Gas	0.20	0.20	0.01	0.20	0.33	0.02
	Distillate Fuel, 0.5% S	0.32	0.32	2.03	0.57	0.14	0.01

3. Visible Emissions

BACT for visible emissions from Boilers 260-5, 260-6 and 260-7 when firing natural gas shall be a maximum of 10% opacity on a six-minute block average basis.

BACT for visible emissions from Boiler 260-7 when firing distillate fuel shall be a maximum of 20% opacity on a six-minute block average basis.

4. Periodic Monitoring

Periodic monitoring for boilers 260-5, 260-6 and 260-7 shall include recordkeeping to document fuel use both on a monthly and 12-month rolling total basis. Documentation shall include the type of fuel used and sulfur content of the fuel, if applicable.

5. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Due to their sizes, Boilers 260-5, 260-6 and 260-7 are not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

6. National Emission Standards for Hazardous Air Pollutants (NESHAP):
40 C.F.R. Part 63, Subpart JJJJJ

Gas-fired boilers are exempt from the requirements of *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJ (Subpart JJJJJ). A “gas-fired boiler” is defined as any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

Boilers 260-5 and 260-6 are both gas-fired boilers by definition and are therefore not subject to Subpart JJJJJ. [40 C.F.R. §§63.11195(e)]

Boiler 260-7 is being licensed as a dual fuel-fired boiler, capable of firing either natural gas or distillate fuel. As such, it is subject to the requirements of Subpart JJJJJ unless it is operated exclusively as a gas-fired boiler in accordance with the definition above.

If Boiler 260-7 was to be operated exclusively as a gas-fired boiler but later converted to firing distillate fuel, it would then become subject to the applicable requirements of Subpart JJJJJ as a new oil-fired boiler with heat input capacity of less than 5 MMBtu/hr. Subsequently, MEARNG would be required to demonstrate compliance with Subpart JJJJJ within 180 days of the effective date of the fuel switch. Notification of such changes would have to be submitted in accordance with § 63.11125(g).

A summary of 40 C.F.R. Part 63, Subpart JJJJJ requirements applicable to Boiler 260-7 if operated as an oil-fired boiler is listed below. Notification forms and additional rule information can be found on the following website: <http://www.epa.gov/ttn/atw/boiler/boilerpg.html>.

- a. Compliance Dates, Notifications, and Work Practice Requirements

- (1) Initial Notification of Compliance

An Initial Notification submittal to EPA is due within 120 days after the source becomes subject to the standard. [40 C.F.R. § 63.11225(a)(2)]

- (2) Boiler Tune-Up Program

- (i) A boiler tune-up program shall be implemented. [40 C.F.R. § 63.11223]

Based on its size and age, boiler 260-7 is not required to have an initial performance tune-up.

(ii) Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

<u>Boiler Category</u>	<u>Tune-Up Frequency</u>
Oil fired boilers with a heat input capacity of ≤ 5 MMBtu/hr	Every 5 years

[40 C.F.R. § 63.11223(a) and Table 2]

(iii) The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:

1. As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted for up to 72 months from the previous inspection for oil fired boilers less than or equal to 5 MMBtu/hour. [40 C.F.R. § 63.11223(b)(1)]
2. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 C.F.R. § 63.11223(b)(2)]
3. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted for up to 72 months from the previous inspection for oil fired boilers less than or equal to 5 MMBtu/hour. [40 C.F.R. § 63.11223(b)(3)]
4. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 C.F.R. § 63.11223(b)(4)]
5. Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 C.F.R. § 63.11223(b)(5)]
6. If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 C.F.R. § 63.11223(b)(7)]

(iv) Tune-Up Report: A tune-up report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the following information:

1. The concentration of CO in the effluent stream (ppmv) and oxygen (volume percent) measured at high fire or typical operating load both **before and after** the boiler tune-up;

2. A description of any corrective actions taken as part of the tune-up of the boiler; and
3. The types and amounts of fuels used over the 12 months prior to the tune-up of the boiler, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel use by each unit. [40 C.F.R. § 63.11223(b)(6)]

(3) Compliance Report

A compliance report shall be prepared by March 1st every five years which covers the previous five calendar years. The report shall be maintained by the source and submitted to the Department and/or to the EPA upon request. The report must include the items contained in §§ 63.11225(b)(1) and (2), including the following: [40 C.F.R. § 63.11225(b)]

- (i) Company name and address;
- (ii) A statement of whether the source has complied with all the relevant requirements of this Subpart;
- (iii) A statement certifying truth, accuracy, and completeness of the notification and signed by a responsible official and containing the official's name, title, phone number, email address, and signature;
- (iv) The following certifications, as applicable:
 1. "This facility complies with the requirements in 40 C.F.R. § 63.11223 to conduct tune-ups of each boiler in accordance with the frequency specified in this Subpart."
 2. "No secondary materials that are solid waste were combusted in any affected unit."
 3. "This facility complies with the requirement in §§ 63.11214(d) and 63.11223(g) to minimize the boiler's time spent during startup and shutdown and to conduct startups and shutdowns according to the manufacturer's recommended procedures or procedures specified for a boiler of similar design if manufacturer's recommended procedures are not available."

b. Recordkeeping

Records shall be maintained consistent with the requirements of 40 C.F.R. Part 63, Subpart JJJJJ including the following [40 C.F.R. § 63.11225(c)]:

- (1) Copies of notifications and reports with supporting compliance documentation;
- (2) Identification of each boiler, the date of tune-up, procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned;
- (3) Records of the occurrence and duration of each malfunction of each applicable boiler; and
- (4) Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning boiler.

Records shall be in a form suitable and readily available for expeditious review.

C. Annual Emissions

This amendment does not affect MEARNG's licensed annual emissions because:

- The boilers being installed have emission rates that are equal to or lower than the emission rates of the boilers being removed, and the boilers at MEARNG are subject to an annual fuel usage restriction.
- Emissions from Tank 11 were not previously factored into MEARNG's licensed annual emissions.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-755-71-K-A subject to the conditions found in Air Emission License A-755-71-I-R/A and in amendment A-755-71-J-A, and the following conditions.

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

SPECIFIC CONDITIONS

Distillate fuel-fired boilers AFRC-1 and AFRC-2 are scheduled to be permanently removed from service at MEARNG during calendar year 2018. Until they are removed, all conditions found in the Orders for Air Emission License A-755-71-I-R/A (July 18, 2014), and Air Emission License A-755-71-J-A (March 3, 2017) that pertain to these boilers shall remain in effect. Once boilers AFRC-1 and AFRC-2 have been permanently taken out of service, the following will replace Specific Condition (17), found in the Air Emission License A-755-71-I-R/A (July 18, 2014), and Air Emission License A-755-71-J-A (March 3, 2017) in its entirety.

(17) Distillate Fuel-Fired Boilers

As a result of the changes documented in this amendment, MEARNG no longer operates boilers at their facility that exclusively fire distillate fuel. Subsequently, Specific Condition (17) is no longer relevant and has been removed from the Air Emission License.

Dual fuel-fired boilers 260-2, 260-3 and 260-4 are scheduled to be permanently removed from service at MEARNG during calendar year 2018. Until they are removed, all conditions found in the Orders for Air Emission License A-755-71-I-R/A (July 18, 2014), and Air Emission License A-755-71-J-A (March 3, 2017) that pertain to these boilers shall remain in effect. Once boilers 260-2, 260-3 and 260-4 have been permanently taken out of service, the following conditions will replace Specific Conditions (18)(A) and (18)(B) found in the Air Emission License A-755-71-I-R/A (July 18, 2014), and Air Emission License A-755-71-J-A (March 3, 2017).

(18) Dual Fuel-Fired Boiler 260-7

A. Particulate Emissions

Emissions from Boiler 260-7 shall not exceed the following while firing natural gas:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 260-7	PM	0.05	06-96 M.R. ch. 115, BACT

Emissions from Boiler 260-7 shall not exceed the following while firing distillate fuel:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 260-7	PM	0.08	06-096 C.M.R. ch. 115, BACT

B. Emissions from boiler 260-7 shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

<u>Unit</u>	<u>Fuel</u>	<u>PM (lb/hr)</u>	<u>PM₁₀ (lb/hr)</u>	<u>SO₂ (lb/hr)</u>	<u>NO_x (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOC (lb/hr)</u>
Boiler 260-7 (4.0 MMBtu/hr)	Distillate Fuel	0.32	0.32	2.03	0.57	0.14	0.01
	Natural Gas	0.20	0.20	0.01	0.20	0.33	0.02

DONE AND DATED IN AUGUSTA, MAINE THIS 3 DAY OF January, 2018.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Core for
PAUL MERCER, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-755-71-I-R/A.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 12, 2017

Date of application acceptance: August 1, 2017

Date filed with the Board of Environmental Protection:

This Order prepared by Patric J. Sherman, Bureau of Air Quality.

