



DEPARTMENT ORDER

Huhtamaki, Inc.
Kennebec County
Waterville, Maine
A-416-77-4-A

Departmental
Findings of Fact and Order
New Source Review
NSR #4

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	Huhtamaki, Inc.
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	322299
NATURE OF BUSINESS	Molded Pulp Products Manufacturing
FACILITY LOCATION	242 College Avenue, Waterville, Maine

B. NSR License Description

Huhtamaki, Inc. (Huhtamaki) has requested a New Source Review (NSR) license to replace an existing fire pump with a new fire pump, add existing emergency generators to the license, and clarify waste fuel tracking requirements.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Generators/Engines

Equipment	Max. Heat Input Capacity (MMBtu/hr)	Max. Firing Rate	Output (kW)	Fuel Type, % sulfur	Mfr. Date	Install. Date
EG-1 ^a	0.87	848 scf/hr	50	Natural gas, neg.	1996	1996 ^c
EG-2 ^a	0.18	1.98 gal/hr	7	Liquified petroleum gas (LPG), neg.	2012	2012 ^c
EG-3 ^a	0.19	2.11 gal/hr	9.5	LPG, neg.	2003	2003 ^c

Equipment	Max. Heat Input Capacity (MMBtu/hr)	Max. Firing Rate	Output (kW)	Fuel Type, % sulfur	Mfr. Date	Install. Date
EG-4 ^a	1.37	15.1 gal/hr	100	LPG, neg.	2002	2002 ^c
EG-5 ^a	0.18	2.02 gal/hr	9	LPG, neg.	1996	1996 ^c
EG-6 ^a	0.18	2.02 gal/hr	9	LPG, neg.	1995	1995 ^c
EG-7 ^a	0.19	2.11 gal/hr	9.5	LPG, neg.	2003	2003 ^c
EG-8 ^a	0.17	1.82 gal/hr	7.5	LPG, neg.	1993	1993 ^c
EG-9 ^a	0.27	2.97 gal/hr	10.4	LPG, neg.	2007	2007 ^c
FP-1	1.42	10.3 gal/hr	145	Distillate fuel, 0.0015%	2021	2022
<i>Fire Pump^b</i>	<i>1.2</i>	<i>8.9 gal/hr</i>	<i>85</i>	<i>Distillate fuel, 0.0015%</i>	<i>1966</i>	<i>1966</i>

^a Existing engines not previously licensed.

^b Removed from license.

^c Estimated date of installation.

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Stack #
Boiler #2	32.6	32 Mscf/hr	Natural gas, negligible	1
	29.3	195.3 gal/hr	#6 Fuel Oil/Spec.Waste Oil, 0.7%	
Boiler #3	32.6	32 Mscf/hr	Natural gas, negligible	1
	29.3	195.3 gal/hr	#6 Fuel Oil/Spec.Waste Oil, 0.7%	
Boiler #5	71.3	69.9 Mscf/hr	Natural gas, negligible	3
	64.8	432 gal/hr	#6 Fuel Oil/Spec.Waste Oil, 0.7%	

D. 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 a new fire pump, the initial licensing of existing emergency engines, and changes to the tracking of waste oil use 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. The selected 24-month baseline period can differ on a pollutant-by-pollutant basis. However, there are no existing emission units which are considered “affected” by this project.

While there are changes to monitoring requirements for Boilers #2, #3, and #5 in this NSR, emissions from these units will not change as a result of this license. Therefore, these units are not included in this section.

The other 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 year is unnecessary.

2. Projected Actual Emissions

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

Projected Actual Emissions

Equipment	PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)	NO _x (tpy)	CO (tpy)	VOC (tpy)
Emergency Engines	0.01	0.01	0.01	--	0.6	0.6	0.04
Total	0.01	0.01	0.01	--	0.6	0.6	0.04

3. Emissions Increases

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

Pollutant	Baseline Actual Emissions (ton/year)	Projected Actual Emissions (ton/year)	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	0	0.01	0.01	25
PM ₁₀	0	0.01	0.01	15
PM _{2.5}	0	0.01	0.01	10
SO ₂	0	--	--	40
NO _x	0	0.6	0.6	40
CO	0	0.6	0.6	100
VOC	0	0.04	0.04	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. Huhtamaki 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. EG-1 and EG-3 through EG-9

Emergency generators EG-1, EG-3, EG-4, EG-5, EG-6, EG-7, EG-8, and EG-9 are currently installed at Huhtamaki, but have not previously been included in the facility’s air emission license. Huhtamaki has requested that these units be added to the license.

The emergency generators are generator sets with each gen set consisting of an engine and an electrical generator. The emergency generators have engines rated at 0.87 MMBtu/hr, 0.19 MMBtu/hr, 1.37 MMBtu/hr, 0.18 MMBtu/hr, 0.18 MMBtu/hr, 0.19 MMBtu/hr, 0.17 MMBtu/hr, and 0.27 MMBtu/hr. EG-1 fires natural gas, and EG-3 through EG-9 fire LPG. The emergency generators were all manufactured prior to 2006.

1. BACT Findings

The BACT emission limits for EG-1 are based on the following:

- PM/PM₁₀ - 7.71 E-05 lb/MMBtu from AP-42 Table 3.2-2 dated 7/2000
- SO₂ - 5.88 E-04 lb/MMBtu from AP-42 Table 3.2-2 dated 7/2000
- NO_x - 4.08 lb/MMBtu from AP-42 Table 3.2-2 dated 7/2000
- CO - 0.317 lb/MMBtu from AP-42 Table 3.2-2 dated 7/2000
- VOC - 0.118 lb/MMBtu from AP-42 Table 3.2-2 dated 7/2000
- Visible Emissions - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for EG-3 through EG-9 are based on the following:

- PM/PM₁₀ - 0.05 lb/MMBtu from 06-096 C.M.R. ch. 115, BACT
- SO₂ - 5.88 E-04 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
- NO_x - 2.27 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
- CO - 3.72 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
- VOC - 0.0296 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
- Visible Emissions - 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for the generators 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)
EG-1	--	--	--	3.55	0.28	0.10
EG-3	0.01	0.01	--	0.43	0.71	0.01
EG-4	0.07	0.07	--	3.11	5.10	0.04
EG-5	0.01	0.01	--	0.41	0.67	0.01
EG-6	0.01	0.01	--	0.41	0.67	0.01
EG-7	0.01	0.01	--	0.43	0.71	0.01

Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
EG-8	0.01	0.01	--	0.39	0.63	0.01
EG-9	0.01	0.01	--	0.61	1.00	0.01

Visible emissions from each of the emergency generators shall not exceed 10% opacity on a six-minute block average basis except for periods of startup during which time Huhtamaki may comply with the following work practice standards in lieu of the numerical visible emissions standard.

- a. Maintain a log (written or electronic) of the date, time, and duration of all generator startups.
- b. Operate the generators in accordance with the manufacturer's emission-related operating instructions.
- c. Minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations shall apply.
- d. Operate the generators, including any associated air pollution control equipment, at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

The Department has determined that the proposed BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit for each generator has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to EG-1, EG-3, EG-4, EG-5, EG-6, EG-7, EG-8, and EG-9. They are emergency generators powered by an engine with a rated output of less than 1,000 brake horsepower (747 kW). Chapter 169 identifies emission standards for generator engines subject to this chapter and stack height requirements for certain generator engines subject to this chapter.

For EG-1, EG-3, EG-4, EG-5, EG-6, EG-7, EG-8 and EG-9, Huhtamaki shall comply with the emission standards for emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart ZZZZ. [06-096 C.M.R. ch. 169, § 4(B)(1)]

3. New Source Performance Standards (NSPS)

Due to the dates of manufacture of the spark ignition emergency engines listed above, the engines are not subject to the New Source Performance Standards (NSPS) *Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE)*, 40 C.F.R. Part 60, Subpart JJJJ since the units were manufactured before January 1, 2009. [40 C.F.R. § 60.4230]

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

National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, 40 C.F.R. Part 63, Subpart ZZZZ is applicable to the emergency engines listed above. The units are considered existing, emergency stationary reciprocating internal combustion engines at an area HAP source and are not subject to New Source Performance Standards regulations. EPA's August 9, 2010 memo (*Guidance Regarding Definition of Residential, Commercial, and Institutional Emergency Stationary RICE in the NESHAP for Stationary RICE*) specifically does not exempt these units from the federal requirements. [40 C.F.R. § 63.6585]

A summary of the currently applicable federal 40 C.F.R. Part 63, Subpart ZZZZ requirements is listed below.

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 63, Subpart ZZZZ, a stationary reciprocating internal combustion engine (RICE) is considered an **emergency** stationary RICE (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 63, Subpart ZZZZ, 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 RICE 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.

EG-1 and EG-3 through EG-9 shall be limited to the usage outlined in 40 C.F.R. § 63.6640(f) and therefore may be classified as existing emergency stationary RICE as defined in 40 C.F.R. Part 63, Subpart ZZZZ. Failure to comply with all of the requirements listed in 40 C.F.R. § 63.6640(f) may cause these engines to not be considered emergency engines and therefore subject to all applicable requirements for non-emergency engines.

b. 40 C.F.R. Part 63, Subpart ZZZZ Requirements

(1) Operation and Maintenance Requirements
(40 C.F.R. § 63.6603(a) and Table 2(d))

	Operating Limitations
Spark ignition (natural gas, propane) units: EG-1, EG-3 through EG-9	<ul style="list-style-type: none">- Change oil and filter every 500 hours of operation or annually, whichever comes first;- Inspect spark plugs every 1000 hours of operation or annually, whichever comes first, and replace as necessary; and- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

The engines shall be operated and maintained according to the manufacturer's emission-related written instructions, or Huhtamaki shall develop a maintenance plan which must provide to the extent practicable for the maintenance and operation of the engines in a manner consistent with good air pollution control practice for minimizing emissions. [40 C.F.R. § 63.6625(e)]

(2) Optional Oil Analysis Program

Huhtamaki has the option of utilizing an oil analysis program which complies with the requirements of § 63.6625(i) in order to extend the specified oil change requirement. If this option is used, Huhtamaki must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for each engine. The analysis program must be part of the maintenance plan for each engine. [40 C.F.R. § 63.6625(i)]

(3) Non-Resettable Hour Meter Requirement

A non-resettable hour meter shall be installed and operated on each engine. [40 C.F.R. § 63.6625(f)]

(4) Startup Idle and Startup Time Minimization Requirements

During periods of startup the facility must 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. [40 C.F.R. § 63.6625(h) and 40 C.F.R. Part 63, Subpart ZZZZ Table 2d]

(5) Annual Time Limit for Maintenance and Testing

As emergency engines, the units shall each be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by

providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). [40 C.F.R. § 63.6640(f)]

(6) Recordkeeping

Huhtamaki shall keep records that include maintenance conducted on the engines and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the number of hours each unit operated for emergency purposes, the number of hours each unit operated for non-emergency purposes, and the reason each engine was in operation during each time. [40 C.F.R. § 63.6655(f)]

C. EG-2

Emergency generator EG-2 is currently installed at Huhtamaki but has not previously been included in the facility's air emission license. Huhtamaki has requested that this unit be added to the license.

The emergency generator is a generator set consisting of an engine and an electrical generator. The emergency generator has an engine rated at 0.18 MMBtu/hr which fires LPG. The emergency generator was manufactured in 2012.

1. BACT Findings

The BACT emission limits for EG-2 are based on the following:

- PM/PM₁₀ - 0.05 lb/MMBtu from 06-096 C.M.R. ch. 115, BACT
 - SO₂ - 5.88 E-04 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
 - NO_x - 2.27 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
 - CO - 3.72 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
 - VOC - 0.0296 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
 - Visible - 06-096 C.M.R. ch. 115, BACT
- Emissions

The BACT emission limits for the EG-2 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)
EG-2	0.01	0.01	--	0.41	0.67	0.01

Visible emissions from EG-2 shall not exceed 10% opacity on a six-minute block average basis.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to EG-2. It is an emergency generator powered by an engine with a rated output of less than 1,000 brake horsepower (747 kW). Chapter 169 identifies emission standards for generator engines subject to this chapter and stack height requirements for certain generator engines subject to this chapter.

For EG-2, Huhtamaki shall comply with the emission standards for emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart JJJJ. [06-096 C.M.R. ch. 169, § 4(B)(1)]

3. New Source Performance Standards

Standards of Performance for Spark Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart JJJJ is applicable to EG-2 since the unit was ordered after June 12, 2006, and manufactured after January 1, 2009. [40 C.F.R. § 60.4230] By meeting the requirements of 40 C.F.R. Part 60, Subpart JJJJ, the unit also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

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

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart JJJJ, 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 JJJJ, 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. §§ 60.4243(d) and 60.4248]

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

(1) Manufacturer Certification Requirement

The engines shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 C.F.R. Part 60, Subpart JJJJ, Table 1. [40 C.F.R. § 60.4233]

- (2) Non-Resettable Hour Meter Requirement
A non-resettable hour meter shall be installed and operated on the engine.
[40 C.F.R. § 60.4237]
- (3) Operation and Maintenance Requirement
The engine shall be operated and maintained according to the manufacturer's written instructions or procedures developed by Huhtamaki that are approved by the engine manufacturer. Huhtamaki may only change those settings that are permitted by the manufacturer. [40 C.F.R. § 60.4243]
- (4) Annual Time Limit for Maintenance and Testing
As an emergency engine, the unit shall be limited to 100 hours/year for maintenance and testing. The emergency engine may operate up to 50 hours per year in non-emergency situations, but those 50 hours are included in the 100 hours total allowed for maintenance and testing. The 50 hours for non-emergency use cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity. [40 C.F.R. § 60.4243(d)]
- (5) Recordkeeping
Huhtamaki 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. § 60.4245(b)]

D. FP-1

Huhtamaki intends to replace the existing Fire Pump with a new unit, designated FP-1. The new fire pump has an engine rated at 1.42 MMBtu/hr which fires distillate fuel. FP-1 was manufactured in 2021.

1. BACT Findings

The BACT emission limits for FP-1 are based on the following:

PM/PM ₁₀	- 0.046 lb/MMBtu from 40 C.F.R. Part 60, Subpart IIII, Table 4
SO ₂	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO _x	- 0.92 lb/MMBtu from 40 C.F.R. Part 60, Subpart IIII, Table 4
CO	- 0.79 lb/MMBtu from 40 C.F.R. Part 60, Subpart IIII, Table 4
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 FP-1 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)
FP-1	0.07	0.07	--	1.31	1.12	0.50

Visible emissions from FP-1 shall not exceed 20% opacity on a six-minute block average basis.

BACT for FP-1 includes recordkeeping of all maintenance conducted on each engine.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to FP-1. It is an emergency generator powered by an engine with a rated output of less than 1,000 brake horsepower (747 kW). Chapter 169 identifies emission standards for generator engines subject to this chapter and stack height requirements for certain generator engines subject to this chapter.

For FP-1, Huhtamaki shall comply with the emission standards for emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart III. [06-096 C.M.R. ch. 169, § 4(B)(1)]

3. New Source Performance Standards

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

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

a. Emergency Engine Designation and Operating Criteria

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

Subpart III, resulting in the engine being subject to requirements applicable to **non-emergency** engines.

(1) Emergency Situation Operation (On-Site)

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

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

(2) Non-Emergency Situation Operation

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

- (i) An emergency engine may be operated for a maximum of 100 hours per calendar year for maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government; the manufacturer; the vendor; the regional transmission organization or equivalent balancing authority and transmission operator; or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE more than 100 hours per calendar year.
- (ii) An emergency engine may be operated for up to 50 hours per calendar year for other non-emergency situations. **However, these operating hours are counted as part of the 100 hours per calendar year operating limit described in paragraph (2) and (2) (i) above.**

The 50 hours per calendar year operating limit for other non-emergency situations cannot be used for peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

[40 C.F.R. §§ 60.4211(f) and 60.4219]

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

(1) Manufacturer Certification Requirement

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

(2) Ultra-Low Sulfur Fuel Requirement

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

(3) Non-Resettable Hour Meter Requirement

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

(4) Operation and Maintenance Requirements

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

(5) Annual Time Limit for Maintenance and Testing

As an emergency engine, the unit shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). [40 C.F.R. § 60.4211(f)]

(6) Initial Notification Requirement

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

(7) Recordkeeping

Huhtamaki shall keep records that include 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)]

E. Waste Fuel Tracking

Huhtamaki currently adds waste oil to their #6 fuel oil tank in which the two fuels are stored as a mixture for use in Boilers #2, #3, and #5. Air emission license A-416-70-I-R (2/22/2019) contains conditions requiring that Huhtamaki track waste oil use separately from #6 fuel oil use. Because the waste oil is added directly to the common #6 oil tank, and oil use in the boilers is infrequent, estimating the amount of waste oil combusted in the boilers can be difficult. Huhtamaki has requested that instead of tracking #6 fuel oil and specification waste oil use separately, that the periodic monitoring requirements for Boilers #2, #3, and #5 be updated to require tracking of total fuel oil use (including both #6 fuel oil and specification waste oil, combined), and the amount of specification waste oil added to the #6 fuel oil tank.

There is no licensed limit on the quantity of waste oil combusted in Boilers #2, #3, and #5; however, there are cumulative limits on #6 fuel oil and specification waste oil fired in the boilers. Additionally, each of these units have emission limits based on the combination of #6 fuel oil and specification waste oil and do not have emission limits specific to periods of waste oil combustion.

Huhtamaki shall monitor and record the values indicated in the following tables.

Boilers #2 and #3

Values	Units of Measure	Frequency
Total fuel oil use (including #6 fuel oil and specification waste oil)	Gallons	Monthly and 12-month rolling total
Specification waste oil added to the #6 fuel oil tank	Gallons	Monthly and 12-month rolling total
#6 fuel oil sulfur content	Percent, by weight	Each fuel purchase
Specification waste oil sulfur content	Percent, by weight	Once per calendar year

Boiler #5

Values	Units of Measure	Frequency
Combined fuel use	MMBtu	Monthly and 12-month rolling total
Natural gas use	MMBtu	Monthly and 12-month rolling total
Natural gas use	scf	Monthly and 12-month rolling total
Fuel oil use (#6 and waste oil)	Gallons	Monthly and 12-month rolling total
Percent of total heat input from fuel oil	Percent by MMBtu	Monthly and 12-month rolling total
Fuel oil use (#6 and waste oil)	MMBtu	Monthly and 12-month rolling total
#6 fuel oil sulfur content	Percent, by weight	Each fuel purchase
Waste oil sulfur content	Percent, by weight	Once each calendar year

Huhtamaki shall conduct annual testing of a representative sample of the waste oil utilized demonstrating that it meets the definition of “specification waste oil” found in 06-096 C.M.R. ch. 860. Huhtamaki shall maintain records of the waste oil analysis and submit them to the Department upon request.

F. 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.

G. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility’s annual air license fee and establishing the facility’s potential to emit (PTE). Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included except when required by state or federal regulations. Maximum potential emissions were calculated based on the following assumptions:

- Boilers #2 and #3 firing #6 fuel oil continuously at their maximum rated capacities for 8,760 hours/year (equal to 3,421,656 gallons);
- Boiler #5 firing the oil remaining under the facility fuel cap (equal to 78,344 gallons) and firing natural gas up its license limit of 503.2 MMscf; and
- Operating the emergency engines and fire pump for 100 hrs/yr each.

This information does not represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

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

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Boilers #2, #3, and #5	41.6	41.6	466.1	157.6	30.2	24.9
Emergency Engines and FP-1	--	--	--	0.6	0.6	--
Total TPY	41.6	41.6	466.1	158.2	30.8	24.9

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

Huhtamaki previously submitted an ambient air quality impact analysis outlined in Air Emission License A-416-70-A-I (dated January 15, 2002) demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards (AAQS). An additional ambient 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-416-77-4-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) **EG-1 and EG-3 through EG-9**

- A. Each of the emergency generators shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations.
[06-096 C.M.R. ch. 115, BACT]
- B. 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)
EG-1	--	--	--	3.55	0.28	0.10
EG-3	0.01	0.01	--	0.43	0.71	0.01
EG-4	0.07	0.07	--	3.11	5.10	0.04
EG-5	0.01	0.01	--	0.41	0.67	0.01
EG-6	0.01	0.01	--	0.41	0.67	0.01
EG-7	0.01	0.01	--	0.43	0.71	0.01
EG-8	0.01	0.01	--	0.39	0.63	0.01
EG-9	0.01	0.01	--	0.61	1.00	0.01

C. Visible Emissions

Visible emissions from each of the emergency generators shall not exceed 10% opacity on a six-minute block average basis except for periods of startup during which time Huhtamaki may comply with the following work practice standards in lieu of the numerical visible emissions standard. [06-096 C.M.R. ch. 115, BACT]

1. Maintain a log (written or electronic) of the date, time, and duration of all generator startups.
2. Operate the generators in accordance with the manufacturer's emission-related operating instructions.

3. Minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations shall apply.
 4. Operate the generators, including any associated air pollution control equipment, at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.
- D. EG-1 and EG-3 through EG-9 shall meet the applicable requirements of 40 C.F.R. Part 63, Subpart ZZZZ, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BACT and ch. 169]
1. Huhtamaki shall meet the following operational limitations for each of the spark ignition emergency engines (EG-1 and EG-3 through EG-9):
 - a. Change the oil and filter every 500 hours of operation or annually, whichever comes first;
 - b. Inspect the spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and
 - c. Inspect the hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Records shall be maintained documenting compliance with the operational limitations.

[40 C.F.R. § 63.6603(a) and Table 2(d); and 06-096 C.M.R. ch. 115]

2. Oil Analysis Program Option
Huhtamaki has the option of utilizing an oil analysis program which complies with the requirements of § 63.6625(i) in order to extend the specified oil change requirement. If this option is used, Huhtamaki must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for each engine. The analysis program must be part of the maintenance plan for each engine. [40 C.F.R. § 63.6625(i)]
3. Non-Resettable Hour Meter
A non-resettable hour meter shall be installed and operated on each engine.
[40 C.F.R. § 63.6625(f)]

4. Maintenance, Testing, and Non-Emergency Operating Situations

- a. As emergency engines, the units shall each be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise to 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 logs) of all engine operating hours. [40 C.F.R. § 63.6640(f) and 06-096 C.M.R. ch. 115]
- b. Huhtamaki shall keep records that include maintenance conducted on the engines and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the number of hours each unit operated for emergency purposes, the number of hours each unit operated for non-emergency purposes, and the reason each engine was in operation during each time. [40 C.F.R. §§ 63.6655(e) and (f)]

5. Operation and Maintenance

The engines shall be operated and maintained according to the manufacturer's emission-related written instructions, or Huhtamaki shall develop a maintenance plan which provides to the extent practicable for the maintenance and operation of each engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 C.F.R. § 63.6625(e)]

6. Startup Idle and Startup Time Minimization

During periods of startup, the facility must minimize each engine's time spent at idle and minimize each engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes. [40 C.F.R. § 63.6625(h) & 40 C.F.R. Part 63, Subpart ZZZZ Table 2d]

(2) **EG-2**

- A. EG-2 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 C.M.R. ch. 115, BACT]
- B. 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)
EG-2	0.01	0.01	--	0.41	0.67	0.01

C. Visible Emissions

Visible emissions from the emergency generator shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

D. EG-2 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJ, including the following: [incorporated under 06-096 C.M.R. ch. 115, BACT]

1. Manufacturer Certification

The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad spark ignition engines found in 40 C.F.R. Part 60, Subpart JJJ, Table 1.

2. Non-Resettable Hour Meter

A non-resettable hour meter shall be installed and operated on the engine. [40 C.F.R. § 60.4237 and 06-096 C.M.R. ch. 115, BACT]

3. 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). The 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. § 60.4243(d) and 06-096 C.M.R. ch. 115, BACT]

b. Huhtamaki 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. § 60.4245(b)]

4. Operation and Maintenance

The engine shall be operated and maintained according to the manufacturer's written instructions or procedures developed by Huhtamaki that are approved by the engine manufacturer. Huhtamaki may only change those settings that are permitted by the manufacturer. [40 C.F.R. § 60.4243]

(3) **FP-1**

- A. FP-1 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 C.M.R. ch. 115, BACT]
- B. Huhtamaki shall keep records of all maintenance conducted on the engine associated with FP-1 [06-096 C.M.R. ch. 115, BACT]
- C. 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)
FP-1	0.07	0.07	--	1.31	1.12	0.50

D. Visible Emissions

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

- E. The Fire Pump FP-1 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BACT and 169]

1. Manufacturer Certification

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

2. Ultra-Low Sulfur Fuel

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

3. Non-Resettable Hour Meter

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

4. Annual Time Limit for Maintenance and Testing

- 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. Huhtamaki shall keep records that include 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. Huhtamaki may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. § 60.4211(a)]

(4) **Boilers #2, #3, and #5 Periodic Monitoring**

- A. Huhtamaki shall monitor and record the values for Boilers #2 and #3 indicated in the following table. [06-096 C.M.R. ch. 115 and 140, BPT]

Boilers #2 and #3

Values	Units of Measure	Frequency
Total fuel oil use (including #6 fuel oil and specification waste oil)	Gallons	Monthly and 12-month rolling total
Specification waste oil added to the #6 fuel oil tank	Gallons	Monthly and 12-month rolling total
#6 fuel oil sulfur content	Percent, by weight	Each fuel purchase
Specification waste oil sulfur content	Percent, by weight	Once per calendar year

B. Huhtamaki shall monitor and record values for Boiler #5 as indicated in the following table: [06-096 C.M.R. ch. 115 and 140, BPT]

Boiler #5

Values	Units of Measure	Frequency
Combined fuel use	MMBtu	Monthly and 12-month rolling total
Natural gas use	MMBtu	Monthly and 12-month rolling total
Natural gas use	scf	Monthly and 12-month rolling total
Fuel oil use (#6 and waste oil)	Gallons	Monthly and 12-month rolling total
Percent of total heat input from fuel oil	Percent by MMBtu	Monthly and 12-month rolling total
Fuel oil use (#6 and waste oil)	MMBtu	Monthly and 12-month rolling total
#6 fuel oil sulfur content	Percent, by weight	Each fuel purchase
Waste oil sulfur content	Percent, by weight	Once each calendar year

C. Huhtamaki shall conduct annual testing of a representative sample of the waste oil utilized demonstrating that it meets the definition of “specification waste oil” found in 06-096 C.M.R. ch. 860. Huhtamaki shall maintain records of the waste oil analysis and submit them to the Department upon request.

- (5) If the Department determines that any parameter value pertaining to construction and operation of the proposed emissions units, including but not limited to stack size, configuration, flow rate, emission rates, nearby structures, etc., deviates from what was submitted in the application or ambient air quality impact analysis for this air emission license, Huhtamaki may be required to submit additional information. Upon written request from the Department, Huhtamaki shall provide information necessary to demonstrate AAQS will not be exceeded, potentially including submission of an ambient air quality impact analysis or an application to amend this air emission license to resolve any deficiencies and ensure compliance with AAQS. Submission of this information is due within 60 days of the Department's written request unless otherwise stated in the Department's letter.
[06-096 C.M.R. ch. 115, § 2(O)]

DONE AND DATED IN AUGUSTA, MAINE THIS 8th DAY OF DECEMBER, 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: May 25, 2022

Date of application acceptance: June 10, 2022

Date filed with the Board of Environmental Protection:

This Order prepared by Benjamin Goundie, Bureau of Air Quality.

