



DEPARTMENT ORDER

**Raytheon Technologies Corporation  
Pratt & Whitney  
York County  
North Berwick, Maine  
A-453-71-U-A**

**Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #1**

**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

Pratt & Whitney (P&W) was issued Air Emission License A-453-71-T-R/A on January 3, 2013, for the operation of emission sources associated with the manufacture and repair of aircraft engine parts. The Air Emission License was issued under the name United Technologies Corporation. In April of 2020, the name of the company was changed to Raytheon Technologies Corporation.

P&W has requested an amendment to their license in order to install a natural gas fired pyrolysis oven and a 250 kW natural gas fired emergency generator. P&W has also requested the removal from their license of several pieces of equipment that have been removed from the facility.

The equipment addressed in this license amendment is located at 113 Wells St, North Berwick, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

**Pyrolysis Oven**

<b>Equipment</b>	<b>Max. Capacity (MMBtu/hr)</b>	<b>Maximum Firing Rate</b>	<b>Fuel Type, % sulfur</b>	<b>Date of Manuf.</b>	<b>Date of Install.</b>	<b>Stack #</b>
Pyrolysis Oven #4	3.0	3,000 scf/hr	Natural gas, negligible	2020	2021	PO#4

**Stationary Engine**

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity (hp)	Fuel Type, % sulfur	Firing Rate (scf/hr)	Date of Manuf.	Date of Install.
Emergency Generator #6	2.98	374	Natural gas, negligible	2,983	2020	2021

The following equipment has been removed from the facility and will no longer be included in the air emission license:

**Fuel Burning Equipment (Removed from license)**

Emission Unit ID	Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Stack #
478156	Evaporator	1.04	1,150 scf/hr	Natural gas, negligible	100 B31 09-18

**Process Equipment (Removed from license)**

Emission Unit ID	Equipment	Stack #
477046	Acid/Alkali Tank	100 G32 08-10
477047	Acid/Alkali Tank	100 G32 08-22
477048	Acid/Alkali Tank	100 G32 08-32

**C. Application Classification**

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

The modification of a 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, as follows:

Pollutant	Current License (TPY)	Future License (TPY)	Net Change (TPY)	Significant Emission Levels
PM	1.7	1.9	0.2	100
PM <sub>10</sub>	1.7	1.9	0.2	100
SO <sub>2</sub>	1.3	1.6	0.3	100
NO <sub>x</sub>	24.9	23.5	-1.4	100

Pollutant	Current License (TPY)	Future License (TPY)	Net Change (TPY)	Significant Emission Levels
CO	15.6	16.2	0.6	100
VOC	24.9	24.9	0.0	50

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

#### D. Facility Classification

With the annual fuel limit on the boilers, the facility wide VOC limit, and the operating hours restriction on the emergency generators, the facility is licensed as follows:

- As a synthetic minor source of air emissions, because P&W is subject to license restrictions that keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

## 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. Emergency Generator #6

P&W intends to install a new emergency generator, designated Emergency Generator #6. The emergency generator is a generator set consisting of an engine and an electrical generator. Emergency Generator #6 has an engine rated at 2.98 MMBtu/hr which fires natural gas. Emergency Generator #6 was manufactured in 2020.

#### 1. BACT Findings

P&W has identified a three-way catalyst (TWC) as the primary pollutant reduction technology for a rich-burn, natural gas-fired engine. The TWC consists of a honeycomb substrate which is coated with a high-performance catalyst. The exhaust stream passes

over the catalyst where a chemical reaction takes place that reduces the emissions of NO<sub>x</sub>, CO, and VOC. The TWC system is a technically feasible technology for this engine and is considered a top-level of control. Control efficiencies are stated by the manufacturer to be up to 98% for NO<sub>x</sub>, up to 95% for CO, and up to 90% for VOC.

SO<sub>2</sub> and PM emissions are low for a rich-burn, natural gas-fired engine, and P&W was unable to find any examples of add-on technologies in EPA's RACT/BACT/LAER Clearinghouse<sup>1</sup> that have been required by regulatory agencies for control of these pollutants.

BACT for Emergency Generator #6 shall be the use of a three-way catalyst, the firing of natural gas, and the below emission limits.

The BACT emission limits for Emergency Generator #6 are based on the following:

PM/PM <sub>10</sub>	- 0.0095 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
SO <sub>2</sub>	- 0.000588 lb/MMBtu from AP-42 Table 3.2-3 dated 7/2000
NO <sub>x</sub>	- 0.02 g/hp-hr from manufacturer's data
CO	- 0.23 g/hp-hr from manufacturer's data
VOC	- 0.04 g/hp-hr from manufacturer's data
Visible Emissions	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Emergency Generator #6 are the following:

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator #6	0.03	0.03	0.002	0.02	0.19	0.03

Visible emissions from Emergency Generator #6 shall not exceed 10% opacity on a six-minute block average basis.

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

*Standards of Performance for Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ is applicable to the emergency engine listed above 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*

<sup>1</sup> EPA established the RACT/BACT/LAER Clearinghouse, or RBLC, as a central data base of air pollution technology information, including past Reasonably Available Control Technology (RACT), Best Available Control Technology (BACT), and Lowest Achievable Emission Rate (LAER) decisions contained in New Source Review permits.

*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 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. §§ 60.4243(d) and 60.4248]

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

(1) Manufacturer Certification Requirement

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 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 P&W that are approved by the engine manufacturer. P&W 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

P&W 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)]

C. Pyrolysis Oven #4

P&W intends to install a new pyrolysis oven, designated Pyrolysis Oven #4. Pyrolysis Oven #4 will consist of a primary oven furnace containing two 0.5 MMBtu/hr natural gas burners and a secondary chamber thermal oxidizer containing a 2 MMBtu/hr natural gas burner. Pyrolysis ovens are used for the removal of inaccessible maskant coating used to protect parts during manufacturing. The maskants primarily consist of polyester and polyurethane.

There will be two sources of emissions from Pyrolysis Oven #4: emissions from natural gas combustion, and emissions of VOC and PM flashing off from products being heated in the oven. The organic/gas mixture from the oven passes through the secondary combustion chamber where it is treated through combustion. This thermal oxidation has been identified as a top-rank control technology for PM and VOC emissions from pyrolysis ovens, with control efficiencies up to 95% for PM and 98% for VOC.

BACT for Pyrolysis Oven #4 shall be the use of natural gas as a fuel, a secondary chamber thermal oxidizer with a retention time of 0.5 seconds or greater at a minimum temperature of 1,300 °F, and the following emission limits.

The BACT emission limits for Pyrolysis Oven #4 are based on the following:

PM/PM <sub>10</sub>	1.9 lb/MMscf natural gas fired, from AP-42 Table 1.4-2 dated 7/1998
	0.012 lb/lb maskant, based on testing of similar ovens
SO <sub>2</sub>	0.6 lb/MMscf natural gas fired, from AP-42 Table 1.4-2 dated 7/1998
NO <sub>x</sub>	100 lb/MMscf natural gas fired, from AP-42 Table 1.4-1 dated 7/1998
CO	84 lb/MMscf natural gas fired, from AP-42 Table 1.4-1 dated 7/1998
VOC	5.5 lb/MMscf natural gas fired, from AP-42 Table 1.4-2 dated 7/1998
	0.0743 lb/lb maskant, based on testing of similar ovens
Visible Emissions	06-096 C.M.R. ch. 101

P&W conservatively estimates 50 lbs of maskant processed per cycle and a 6-hour cycle time.

The BACT emission limits for Pyrolysis Oven #4 are the following:

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Pyrolysis Oven #4	0.011	0.011	0.002	0.30	0.25	0.047

Visible emissions from Pyrolysis Oven #4 shall not exceed 20 percent opacity on a six-minute block average basis.

D. 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. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on the following assumptions:

- Firing 230,000,000 scf/yr natural gas in the boilers;
- Operating the Emergency Generators and Fire Pumps each for 100 hrs/yr;
- Operating the Pyrolysis Ovens for 8,760 hr/yr.

Please note, this information provides the basis for fee calculation only and should not be construed to 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 <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Boilers	1.0	1.0	0.1	11.6	9.8	0.7
Emergency Generators and Fire Pumps (excluding Emergency Generator #6)	0.1	0.1	0.1	1.1	0.3	0.1
Emergency Generator #6	0.1	0.1	0.1	0.1	0.1	0.1
Emissions from process equipment including; nitric acid, ceramic coating areas, & adhesive bonding stations	0.5	0.5	1.1	7.4	4.5	23.7
Pyrolysis Ovens #1-#3	0.1	0.1	0.1	2.0	0.4	0.1
Pyrolysis Oven #4	0.1	0.1	0.1	1.3	1.1	0.2
<b>Total TPY</b>	<b>1.9</b>	<b>1.9</b>	<b>1.6</b>	<b>23.5</b>	<b>16.2</b>	<b>24.9</b>



Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

### III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM <sub>10</sub>	25
SO <sub>2</sub>	50
NO <sub>x</sub>	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license amendment.

### 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-453-71-U-A subject to the conditions found in Air Emission License A-453-71-T-R/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**

Specific Conditions (17) and (24) of Air Emission License A-453-71-T-R/A are hereby removed.

The following are new conditions to Air Emission License A-453-71-T-R/A:

**(30) Emergency Generator #6**

- A. Emergency Generator #6 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. P&W shall maintain and operate the three-way catalyst installed by the manufacturer on Emergency Generator #6. [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 <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator #6	0.03	0.03	0.002	0.02	0.19	0.03

**D. Visible Emissions**

Visible emissions from Emergency Generator #6 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

- E. Emergency Generator #6 shall meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJJ, 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 JJJJ, 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, BPT]

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, BPT]

b. P&W 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 P&W that are approved by the engine manufacturer. P&W may only change those settings that are permitted by the manufacturer. [40 C.F.R. § 60.4243]

(31) **Pyrolysis Oven #4**

A. Emissions from Pyrolysis Oven #4 shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Pyrolysis Oven #4	0.011	0.011	0.002	0.30	0.25	0.047

B. Visible Emissions

Visible emissions from Pyrolysis Oven #4 shall not exceed 20 percent opacity on a six-minute block average basis. [06-096 C.M.R. ch. 101]

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- C. P&W shall operate the secondary combustion chamber of Pyrolysis Oven #4 with a minimum residence time of 0.5 seconds at 1,300 °F. A log shall be maintained continually documenting the temperature of the oven and secondary combustion chamber whenever Pyrolysis Oven #4 is operating. [06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 29<sup>th</sup> DAY OF JUNE, 2021.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for  
MELANIE LOYZIM, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-453-71-T-R/A.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: March 2, 2021

Date of application acceptance: March 4, 2021

Date filed with the Board of Environmental Protection:

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

