



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

**BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	Pratt & Whitney, Division of United Technologies Corporation
Address	1 Aircraft Road, Middletown, CT 06457
Equipment Location	1 Aircraft Road, Middletown, CT 06457
Equipment Description	Inlet Air Heater #2
Town-Permit Numbers	104-0028
Premises Number	0007
Stack Number	115
Prior Permit Issue Date(s)	December 21, 1982 (Original) April 10, 1996 (Revision)
Modification Issue Date	October 20, 2016
Expiration Date	None

/s/ Anne Gobin for
Robert J. Klee
Commissioner

October 20, 2016
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

The Pratt & Whitney Middletown facility engages in manufacturing processes, assembly and testing of experimental and production aircraft engines, ground based turbine engines and components, as well as overhaul and repair of these jet engines. The non-vitiated inlet air heaters are used to heat the gas turbine inlet air prior to the X-960 experimental engine combustion rig.

B. Equipment Design Specifications

1. Fuel Types: Jet A; Propane
2. Maximum Fuel Firing Rates: 500 gal/hr (Jet A); 14,000 scfh (Propane)
3. Maximum Gross Heat Input (MMBTU/hr): 67.5 (Jet A); 35 (Propane)

C. Stack Parameters

1. Minimum Stack Height (ft): 70
2. Minimum Exhaust Gas Flow Rate (acfm): 76,696
3. Minimum Stack Exit Temperature (°F): 600
4. Minimum Distance from Stack to Property Line (ft): 1600

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. Maximum Fuel Consumption over any Consecutive 12 Month Period (gallons/yr): 78,350 (Jet A); 114,720 (Propane)
2. Maximum Jet A Fuel Sulfur Content (% by weight, dry basis): 0.1%
3. Maximum Hours of Operation: 14 hours/day

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Criteria Pollutants

Pollutant	Jet A (lb/MMBtu)	Propane (lb/MMBtu)	lb/yr ¹	TPY
PM ₁₀	7.4E-3	7.7E-3	160	0.08
SO ₂	0.10	2.0E-4	1,060	0.53
NO _x	0.20	0.20	4,220	2.11
VOC	1.48E-3	8.8E-3	120	0.06
CO	0.037	0.082	1,260	0.63
Pb	8.9E-6		2	0.001

¹Equivalent lb/yr limits are included since the record keeping system calculates in these units.

B. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

C. Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- PM₁₀, CO, VOC for Jet Fuel: Compilation of Air Pollutant Emission Factors, AP-42, fifth edition, Tables 1.3-1, 1.3-2 & 1.3-3, SCC=10200502), May 2010
- SO_x for Jet Fuel: CTDEEP emission factor of 135 S lb/1000 gal, where S is the maximum percent sulfur content by weight
- Pb for Jet Fuel: Compilation of Air Pollutant Emission Factors, AP-42, fifth edition, Table 1.3-10, May 2010
- H₂SO₄ for Jet Fuel: CTDEEP emission factor of 2.45 S lb/1000 gal, where S is the maximum percent sulfur content by weight
- PM₁₀, SO_x, CO, VOC for Propane: Compilation of Air Pollutant Emission Factors, AP-42, fifth edition, Table 1.5-1 (SCC=10201002), July 2008
- NO_x: Latest Stack Test Data

Higher heat values: Jet A: 135,000 BTU/gal, Propane: 91,500 BTU/gal

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. When more than one fuel supply tank is to service this source or when multiple sources, other than Inlet Air Heater #3, are supplied by one fuel tank, a fuel metering device shall be used to continuously monitor fuel feed to this permitted source.
2. Any day that the unit operates, the Permittee shall monitor total hours of operation.

B. Record Keeping

1. The Permittee shall keep records of daily, monthly and consecutive 12 month fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
2. Any day that the unit operates, the Permittee shall keep records of hourly operation.
3. The Permittee shall keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by this equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.
4. The Permittee shall calculate and record the monthly and consecutive 12 month PM₁₀, SO₂, NO_x, VOC, CO and lead emissions in units of pounds. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.
5. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

PART V. STACK EMISSION TEST REQUIREMENTS

Any required stack emission testing shall be performed in accordance with the [Emission Test Guidelines](#) available on the DEEP website.

Not applicable at this time.

PART VI. OPERATION AND MAINTENANCE REQUIREMENTS

The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

PART VII. SPECIAL REQUIREMENTS

- A.** The Permittee shall comply with all applicable sections of the following National Emission Standards for Hazardous Air Pollutants at all times.

Title 40 CFR Part 63 Subparts DDDDD and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

- B.** The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23. [STATE ONLY REQUIREMENT]

- C. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

PART VIII. ADDITIONAL TERMS AND CONDITIONS

- A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B. Any representative of DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.
- D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.
- E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."
- F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the

word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

- I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.



NSR Engineering Evaluation
 CT Department of Energy and Environmental Protection
 Bureau of Air Management

Company Name:	Pratt & Whitney, Division of United Technologies Corporation	Permit No.:	104-0028 and 104-0029
Equipment Location:	1 Aircraft Road, Middletown, CT 06457	Date App Received:	2/22/2016
Mailing Address:	1 Aircraft Road, MS 401-08, Middletown, CT 06457	SIMS No.:	201602349, and 201602350
Contact Person:	Mr. James Spatafora	Date Prepared:	6/21/2016
Contact Title:	EH&S Specialist	Prepared By:	James Grillo
Contact Phone:	860-704-7772	Single or Multiple Units:	Multiple
Contact Email:	james.spatafora@pw.utc.com	Permit Type:	Minor Mod (prepaid)
Ozone:	serious non-attainment	Premises Size:	Major
PM2.5:	attainment	Equipment Size:	Minor
Equipment Description	two Inlet Air Heaters	TV/GPLPE Permit No:	104-0103-TV
Step 1: Complete all the fields above			
Step 2: <input type="button" value="Generate Eval"/>		Step 3: <input type="button" value="Update Fields"/>	

Introduction

Pratt & Whitney, Division of United Technologies Corporation in Middletown has requested a reduction in the allowable firing rate for their two inlet air heaters while firing Jet A, along with a reduction to the allowable annual gallons per year. Both permits have been updated to the latest template and AP-42 emission factors, where applicable. The fuel firing de-rate is due to Pratt & Whitney’s determination that the units are no longer safe to run at the designed maximum rated capacity. The permit now includes sufficient monitoring and record keeping to verify that the proposed firing rates are not exceeded.

Regulatory Applicability:

The changes to both permits are considered minor modifications pursuant to RCSA §22a-174-2a(e)(1).

Discussion of Modification/Revision:

The following changes have been made to the two identical inlet air heater permits:

- Reduced the Jet A firing rate from 600 to 500 gal/hr
- Reduced the allowable annual fuel use from 101,712 to 78,350 gal/yr
- Reduced the Jet A maximum heat input from 80.3 to 67.5 MMBtu/hr
- The applicant has requested that the NOx emissions rate for both Jet A and propane be increased to 0.20 lb/MMBtu since the 2016 NOx RACT stack testing indicated that the units were nearing the allowable

NOx emissions rate. By increasing the allowable emissions limit to 0.20 lb/MMBtu, the NOx emissions rate increases by 1.62 lb/hr. With the proposed increase in the NOx emissions rate along with the proposed de-rate in heat input the units comply with the Stack Height Review and no further analysis is required.

In reviewing the original permit file the current NOx limit was never part of a BACT determination. Therefore, the increase in NOx should not be subject to a new BACT analysis as there will not be any “backsliding” concerning a previous BACT determination.

- The propane emission rates were revised to reflect the most recent AP-42 emission factors.
- The allowable ton/year emission rates have been revised to reflect the short term emission rate changes to the Jet A and propane firing.
- Additional monitoring and record keeping of the total daily hours of operation as required by 40 CFR Part 63 Subpart DDDDD.
- This premises is a major source of NOx and the air heaters are subject to recurring NOx RACT testing pursuant to RCSA §22a-174-22. The most recent such testing was performed in January and March of 2016. The Department is currently proposing to replace RCSA §22a-174-22 with a new RCSA §22a-174-22e and, if promulgated, these units would no longer be required to stack test due to an exemption in the rule for experimental test stands [proposed RCSA §22a-174-22e(c)(6)]. In the event the current RCSA §22a-174-22 remains in force, the testing requirements do not need to be referenced in the permit as they stand alone in regulation. Therefore, there is no need to address testing in the modified permits.
- The units are currently operated as “limited-use” process heaters pursuant to 40 CFR Part 63 Subpart DDDDD. When the Title V permit is modified, the complete requirements of Subpart DDDDD will be incorporated into the Title V permit at that time.
- The applicant has requested that the requirement to calculate emissions in tons on a monthly and consecutive twelve month basis be changed to pounds as that is how their electronic system is designed. A column was added with lb/yr in Part III. A, that equates to the ton/yr limits. This way the permittee will never unknowingly exceed the consecutive twelve month ton/yr limits.

Since the entire permit fee was paid with the application fee and the applicant is agreeable to the modifications, these permits can be issued as final at this time.
(see electronic mail from J. Spatafora dated 10/07/16)

Ambient Air Quality Impact Analysis (Attachment L of NSR Application)

Review Type	Conduct If...	Emissions/Analysis	Dates
Stack Height Review	...screening and refined modeling are not required.	Stack Height (SH): 70 Building Height(BH): 53 Building Width (BW): 162 The lesser of BH *1.3 or BW*1.3 (BL): 68.9 The greater of 32.8 feet or BL (MSH): 69 The equipment passes if SH is greater than or equal to MSH.	Date Approved: 10/03/16

Permit Fee(s) (Double Click to edit)

Equipment Size Major Minor

Permit Type

Permit Fee \$1,750 ea.

Municipality Yes

of Permits/Applications \$3,500

Application Fee Submitted Yes -\$1,880

Was Permit Fee paid with Application Fee? Yes -1620

Additional Application Fees (\$1750 Each)

	Quantity	
BACT Review	<input type="text" value="0"/>	\$0
LAER Review	<input type="text" value="0"/>	\$0

Money Owed **\$0**

Compliance History Review

Was the SIMS Enforcement Report run and reviewed for this applicant?	Yes
Were other bureaus contacted to resolve any outstanding enforcement actions shown in the SIMS Report?	No
What is the date on the Enforcement Section's review of air compliance email?	10/6/2016
Was the compliance record reviewed in accordance with the Environmental Compliance History Policy?	Yes

Approvals

Based on the information submitted by the applicant, this engineering evaluation and the compliance history review, the granting of a permit minor modification is recommended for Pratt & Whitney, Division of United Technologies Corporation.

/s/ James Grillo 10/7/16

James Grillo
APCE

/s/ Susan Amarello 10/12/16

Susan E. Amarello
Supervising APCE

/s/ Jaimeson Sinclair 10/18/16

Jaimeson Sinclair
Assistant Director