

# THE PALM BEACH POST

Published Daily and Sunday  
West Palm Beach, Palm Beach County, Florida

## PROOF OF PUBLICATION

### STATE OF FLORIDA COUNTY OF PALM BEACH

Before the undersigned authority personally appeared Tyler Dixon who on oath says that she is Classified Advertising Manager, Inside Sales of The Palm Beach Post, a daily and Sunday newspaper published at West Palm Beach in Palm Beach County, Florida; that the attached copy of advertising, being a Notice in the matter of Air Const Permit in the --- Court, published in said newspaper in the issues of July 23, 2001.

Affiant further says that the said The Post is a newspaper published at West Palm Beach, in said Palm Beach County, Florida, and that the said newspaper has heretofore been continuously published in said Palm Beach County, Florida, daily and Sunday and has been entered as second class mail matter at the post office in West Palm Beach, in said Palm Beach County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she/he has neither paid nor promised any person, firm or corporation any discount rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before this 26 day of July,  
A.D. 2001

[Signature]  
[Signature]

Personally known XX or Produced Identification \_\_\_\_\_  
Type of Identification Produced \_\_\_\_\_



NO. 381874  
PUBLIC NOTICE OF INTENT  
TO ISSUE AIR  
CONSTRUCTION PERMIT  
STATE OF FLORIDA  
DEPARTMENT OF  
ENVIRONMENTAL  
PROTECTION  
SEP File No.  
080021-004-AC  
(APP-PL-R04)  
United Technologies  
Corp.-Pratt & Whitney  
LDA/Kerosene Section  
Engines Test Stand  
West Palm Beach County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to United Technologies Corp.-Pratt & Whitney for construction of a LDA/Kerosene Section Engines Test Stand located at 17000 Saddle Creek Highway, near Jupiter, Palm Beach County, a Best Available Control Technology (BACT) determination was required for emissions of carbon monoxide (CO) pursuant to Rule 62-212.000, F.A.C., Prevention of Significant Deterioration (PSD). The applicant's meeting address is: United Technologies Corp.-Pratt & Whitney, Post Office Box 10000, West Palm Beach, Florida 33410-0000.

Emissions of CO are estimated to be approximately 1,000 lbs per year. These emissions, shall be restricted by means of fuel usage to 310,000 gallons per year, fuel usage to 12,000 gal, and duration of testing to 240 seconds each. The physical emission to test cells will be 2.72 pounds of oxygen per ton of fuel. The Department will require the applicant to establish and operate an ambient air quality monitoring program.

An air quality impact analysis was conducted. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standards of PSD increment. The Department will issue the permit with the attached conditions unless a petition received in accordance with the following procedures results in a different decision or significant change of terms of conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit procedure within a period of thirty (30) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2800 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32309-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change to the proposed permit or action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an Administrative Hearing is filed pursuant to sections 120.006 and 120.07 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. Requests to not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing pursuant to sections 120.006 and 120.07 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3000 Commonwealth Boulevard, Mail Station 205, Tallahassee, Florida 32309-2006. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any person other than those entitled to written notice under section 120.006(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.006(3), however, any person who filed the De-

West Palm Beach, FL  
394195425  
Telephone: 561/881-6800  
FAX: 561/881-8789  
The complete permit file includes the application, technical evaluations, draft permit, and the information submitted by the responsible official, schedules of conditional records under Section 408.111, F.S. Interested persons may contact the Administrator, New Source Review Section at 111 South Morningside Drive, Suite 4, Tallahassee, FL 32301 or call 561/881-6414 for additional information. The Department's intent to issue and related documents can also be viewed at <http://www.dep.state.fl.us/permits/permits.htm> / <http://permits/permits.htm> / <http://dep.state.fl.us/permits.htm>  
PUB: The Palm Beach Post  
July 23, 2001

**EXHIBIT F-1 (Rev. 10/1)**

file or whose receipt date of receipt of this notice of intent, whichever occurs first. Under section 120.36(2), however, any person who sends the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall send a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative hearing (hearings) under sections 120.36(3) and 120.37 F.S., or to intervene in the proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's type or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact; if there are none, the petitioner must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information set forth above, as required by rule 28-106.301.

Because the administrative hearing process is designed to facilitate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in the notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 9:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Protection  
 Bureau of Air Regulation  
 Suite 4, 875 S. Congress Dr.  
 Tallahassee, FL 32301  
 Telephone: 850/480-2114  
 Fax 850/822-0070  
 Palm Beach County Health Dept.  
 Env. Science & Engineering Div.  
 901 Europa Blvd.  
 West Palm Beach, FL 33401  
 Telephone: 561/555-2070  
 Fax 561/304-5441  
 Dept. of Environmental Protection  
 Southeast District Office  
 400 North Congress Avenue

# Memorandum

# Florida Department of Environmental Protection

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TO: Clair Fancy

FROM: A. A. Linero

*aal* 7/9

DATE: July 9, 2001

SUBJECT: United Technologies Corp.-Pratt & Whitney  
DEP File No. 0990021-004-AC (PSD-FL-294)  
LOX/Kerosene Rocket Engine Test Stand

Attached for your review and approval is the revised Intent to Issue for the construction of a LOX/Kerosene Rocket Engine Test Stand at the subject facility near in Palm Beach County.

Pratt & Whitney never published notice and instead requested extensions of time to file a petition. We had a teleconference with them in early May and they met with Palm Beach a few days later. We made several changes in the draft package and are ready to send it out again.

Pratt and Whitney has not been in a rush for this permit. They seem to be concerned about many small details that could probably have been ironed during the comment period after public notice.

They asked for another 90-day extension of time on May 17 "to allow P&W and FDEP to complete our work on this permit and resolve these issues without the necessity for a formal hearing."

Let's send out the revised package. I'll let them know we might publish it if they don't.

I recommend your approval and signature.

AAL/

Permittee

United Technologies Corp.-Pratt & Whitney  
P.O. Box 109600  
Permit No.

0990021-004-AC  
PSD-FL-294

West Palm Beach, FL 33410-9600  
Project  
LOX/Kerosene Rocket Engine Test Stand

Expires:  
March 31, 2003

AUTHORIZED REPRESENTATIVE:

Mr. John K. Sillan, Manager Facilities Management

#### Project and Location

This permit authorizes the permittee to construct a LOX/Kerosene Rocket Engine Test Stand at its existing facility at 17900 Beeline Highway (SR 710) in West Palm Beach, Palm Beach County. The test stand shall be limited to firing no more than 318,000 gallons of fuel per year and required to establish an ambient air quality monitoring program. The SIC codes for this facility is are 3724 and 3764.

The UTM coordinates of the site are Zone 17; 567.3 km E; 2974.4 km N. The Everglades National Park is approximately 120 km (74.9 miles) from the site.

#### Statement of Basis

This construction/PSD permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to construct the emissions units in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

#### Appendices

The attached appendices are a part of this permit:

#### Appendix BD

BACT Determination

#### Appendix GC

General Permit Conditions

#### Appendix NSPS-Kb

40 CFR 60 Subpart Kb - Standards Of Performance For Volatile Organic Liquid Storage Vessels

Howard L. Rhodes, Director  
Division of Air Resources  
Management

Facility Description

United Technologies Corp.- Pratt & Whitney (UTC-P&W) proposes to construct a Liquid Oxygen (LOX)/Kerosene Rocket Engine Test Stand at the E-5 rocket test area located at 17900 Beeline Highway (SR 710) in West Palm Beach, Palm Beach County.

The proposed project will result in a significant emissions increase of carbon monoxide (CO) according to Table 212.400-2, Florida Administrative Code (F.A.C.). The project is therefore subject to review for Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rule 62-212.400, F.A.C.

Project Details

The applicant proposes to <sup>approximately</sup> construct and operate a <sup>normal</sup> LOX/Kerosene Rocket Engine Stand at its existing rocket test facility in West Palm Beach. The applicant also operates a gas turbine testing facility and a helicopter development facility at the existing site. This project will consist of liquid oxygen and fuel storage tanks (64,000 and 36,000 gallon capacities), an engine containment can, a water-cooled silencer, an exhaust gas deflector, a lined cooling water retention pond, and an elevated 1-million gallon water supply tank.

The proposed facility will consist of the following emissions units.

Emissions Unit No.

Emissions unit Description

075

LOX/Kerosene Rocket Engine Test Stand

076

NSPS Storage Tank - <sup>approximately</sup> 36,000 Gallon Capacity

Regulatory Classification

The facility is classified as a Major or Title V Source of air pollution under the PSD and Title V programs because the facility is a major source based on potential emissions of carbon monoxide (CO), volatile organic compounds (VOC), nitrogen oxides (NOx), sulfur dioxide (SO2), trichloroethylene, and total combined hazardous air pollutants (HAPs) exceeding 25 tons per year. This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. The project permitted herein is subject to the requirements of the federal Prevention of Significant Deterioration air quality rules for CO emissions and New Source Performance Standards for fuel storage tanks as well as state rules cited in the general and specific conditions.

Reviewing and Process Schedule

*	Date of Receipt of Application	06-20-00	
*	First Request for Additional Information		07-19-00
*	Final Request for Additional Information		10-01-00
*	Date Application Complete	10-09-00	
*	Waiver of Processing Clock by 30 days		12-19-00

\* Intent Issued 01-29-01  
\* Received First Request to Extend Time to File Petition  
02-22-01  
\* Received Second Request to Extend Time to File Petition  
05-17-01  
\* Intent Re-issued

xx-xx-01

→ put something in

#### Relevant Documents

The documents listed below constitute the basis for the permit and are on file with the Department.

\* Permit application  
\* Applicant's additional information noted above  
\* Department's Technical Evaluation and Preliminary Determination and Intent to Issue

The following specific conditions apply to all emissions units at this facility addressed by this permit.

#### Administrative

1. Regulating Agencies: All documents related to applications for permits to construct, or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, phone number 850/488-0114. All documents related to reports, tests, operation permit applications, minor modifications and notifications shall be submitted to the Palm Beach County Health Department, post Office Box 29, 901 Evernia Street, West Palm Beach, Florida 33402-0029, Phone 562-355-3136.

2. General Conditions: The permittee is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-110, 62-204, 62-212, 62-213, 62-296, 62-297 and the Code of Federal Regulations Title 40, Part 60, adopted by reference in the Florida Administrative Code (F.A.C.) regulations. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting or regulations.

[Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]

5. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Expiration: This air construction permit shall expire on March 31, 2003. The permittee, for good cause, may request that this construction/PSD

permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rules 62-210.300(1), 62-4.070(4), 62-4.080, and 62-4.210, F.A.C.] PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified.

[Rules 62-4.070(4), 62-4.210(2) & (3), and 62-210.300(1)(a), F.A.C.] BACT Determination: In conjunction with extension of the 18 month period to commence or continue construction, or extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for the source as applied to any new or modified emission units. [Rules 62-4.070(4), 62-4.210(2) & (3), 62-210.300(1)(a), and 62-212.400(6)(b), F.A.C.]

7. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit must be obtained prior to the beginning of construction or modification.

[Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

8. Title V Operation Permit Required: This permit authorizes construction and/or installation of the permitted emissions unit and initial operation to determine compliance with Department rules. A revision to the facility's Title V operation permit is required for regular operation of the permitted emissions unit. The owner or operator shall apply for and receive a Title V operation permit or permit modification prior to expiration of this permit. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's appropriate District office.

[Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

General Emissions Limiting Standards

9. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). The test method for visible emissions shall be EPA Method 9, incorporated and adopted by reference in Chapter 62-297, F.A.C. Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C. [Rule 62-296.320(4)(b)1, F.A.C.]

10. Unconfined Emissions of Particulate Matter: [Rules 62-296.320(4)(c) and 62-212.400, F.A.C.]

(i) No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions.

(ii) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

- (iii) Reasonable precautions include the following:
- \* Paving and maintenance of roads, parking areas and yards.
  - \* Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
  - \* Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.
  - \* Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulate from becoming airborne.
  - \* Landscaping or planting of vegetation.
  - \* Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
  - \* Confining abrasive blasting where possible.
  - \* Enclosure or covering of conveyor systems.

(iv) In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

11. General Pollutant Emission Limiting Standards: [Rule 62-296.320(1)(a)&(2), F.A.C.]

(i) No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department.

(ii) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. (Not federally enforceable)

[Note: An objectionable odor is defined in Rule 62-210.200(203), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.]

Operational Requirements

12. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by hazard of fire, wind or by other cause, the permittee shall immediately notify the Department's appropriate district office and the appropriate local program office. The notification shall include pertinent information as to the cause of the problem, and what steps are being taken to correct the problem and to prevent its recurrence, and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with Department rules.

[Rule 62-4.130, F.A.C.]

13. Circumvention: No person shall circumvent any air pollution control device or allow the emission of air pollutants without the applicable air pollution control device operating properly.

[Rule 62-210.650, F.A.C.]

14. Excess Emissions: For purposes of this permit, all limits established pursuant to the State Implementation Plan, including those limits established as BACT, include emissions during periods of startup and shutdown, and are



not subject to the provisions of Rule 62-210.700(1), F.A.C.  
Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during start-up, shutdown or malfunction shall be prohibited pursuant to Rule 62-210.700(4), F.A.C.

[Rules 62-4.070(3) and 62-210.700(5), F.A.C.]

#### Compliance Monitoring and Testing Requirements

15. Determination of Process Variables: [Rule 62-297.310(5), F.A.C.]

(i) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(ii) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

16. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Department.

[Rule 62-297.310(7)(b), F.A.C.]

#### Reporting and Record Keeping Requirements

23. Duration of Record Keeping: Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least five years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

[Rules 62-4.160(14)(a)&(b) and 62-213.440(1)(b)2.b., F.A.C.]

24. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA Method 9 test, shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C.

[Rule 62-297.310(8), F.A.C.]

25. Excess Emissions Report: If excess emissions occur, the owner or

operator shall notify the appropriate Department District Office and the appropriate local program within one working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. ~~Pursuant to the NESHAP requirements, excess emissions shall also be reported in accordance with 40 CFR 63, Subpart A. [Rule 62-4.130, F.A.C.]~~

26. Excess Emissions Report - Malfunctions: In case of excess emissions resulting from malfunctions, each owner or operator shall notify the appropriate Department District Office and the appropriate local program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report if requested by the Department. [Rule 62-210.700(6), F.A.C.]

27. Annual Operating Report for Air Pollutant Emitting Facility: The Annual Operating Report for Air Pollutant Emitting Facility shall be completed each year and shall be submitted to the appropriate Department District Office and the appropriate local program by March 1 of the following year. [Rule 62-210.370(3), F.A.C.]

Subsection A: The following specific conditions apply to the following emissions units:

Emissions  
Unit No.

Emissions unit Description

075  
LOX/Kerosene Rocket Engine Test Stand

Emissions Unit(s) Details

LOX/Kerosene Rocket Engine Test Stand, designated Emissions Unit 075, consisting of an engine containment can, a water-cooled silencer, and an exhaust gas deflector. Emissions are controlled through the use of a minimum oxidant to fuel ratio and the water-cooled silencer.

{Permitting note(s): The emissions unit has been reviewed under the PSD Program for carbon monoxide (CO). As a new major source of CO, the emissions unit is subject to the Best Available Control Technology (BACT) requirements of Rule 62-212.400(5)(c), F.A.C. Potential emissions of particulate matter (PM and PM10), sulfur dioxide (SO2), oxides of nitrogen (NOx), and volatile organic compounds have been estimated at 2.3, 1.4, 1.4, and 2.9 tons per year, respectively. The emissions unit is not subject to any New Source Performance Standards (40 CFR Part 60) or National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61). The emissions unit has been identified as a Source Category for future regulatory action under the National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR Part 63). A case-by-case determination of the Maximum Achievable Control Technology (MACT) under 40 CFR Part 63, Subpart B was not required.}

*Water Cooled Silencer - Approximate diameter of 20 feet in an approximate length of 80 feet and.*

Construction Requirements

A.1. Test Stand: The test stand shall be constructed in accordance with the design specifications provided within the application and the following minimum and maximum specifications:

Exhaust Gas Deflector: ~~Minimum~~ <sup>approximate</sup> height of 70 feet, ~~Maximum~~ <sup>approximate</sup> distance from Water Cooled Silencer of 100 feet. The surface between the water-cooled silencer and the exhaust gas deflector shall be paved to minimize particulate emissions due to soil erosion.

A.2. Oxygen Injection Study: Within one year of initial issuance of this permit, the permittee shall complete and submit to the Department an engineering and cost study evaluating the technical feasibility and cost effectiveness of direct O2 injection for reducing CO emissions in the exhausts of rocket engines tested at the permittee's facility. The study shall evaluate possibilities for direct O2 injection including a heat-shielded, internally cooled oxygen lance for injecting stoichiometric rates of oxygen into the exhaust downstream of the engine. Appropriate kinetic modeling shall be utilized to predict the oxidation reaction rates and overall CO conversion for various configurations of the injection apparatus and various injection locations and methods.

[Rule 62-4.070(3) and BACT]

Operating Restrictions

A.3. Permitted Capacity: The permittee shall not allow, cause, suffer or permit the operation of the unit in excess of the following capacities without prior authorization from the Permitting Authority:

- (i). Test Duration: Rocket engine test firing duration shall not exceed a total of 240 seconds per 8-hour period.
- (ii). Test Firings: Rocket engine test firings shall not exceed 2,880 seconds per year (12-month rolling total).
- (iii). Oxidant/Fuel Ratio: All rocket engine test firings shall be conducted at a minimum oxidant/fuel ratio of 2.72 pounds of oxygen per pound of fuel (*4 minimum average*).

(iv). Fuel Usage: Rocket engine test firings shall not consume more than 6,625 gallons per minute (4-minute average), 26,500 gallons per 8-hour period, and 318,000 gallons per year (12-month rolling total).

(v). Quench Water: All rocket test firings shall be conducted with sufficient water flow to minimize NOX formation.

[BACT, Rules 62-4.160(2), 62-210.200(228), and 62-210.300, ~~etc. rule 12. 62-210~~]

F.A.C.]

(Permitting note: Prior authorization includes the issuance of construction, reconstruction, or modification permits or a determination by the Permitting Authority that the action is not subject to 62-210.300(1), F.A.C.)

A.4. Methods of Operation: The permittee shall not allow, cause, suffer or permit any change in the method(s) of operation resulting in increased short-term or long-term potential emissions, without prior authorization from the Permitting Authority. The authorized methods of operation include the following:

(i) Fuels: The permittee is authorized to use kerosene as the rocket engine fuel.

(ii) Oxidants: The permittee is authorized to use liquid oxygen (LOX) as the rocket engine fuel oxidizer.

[BACT, Rules 62-4.160(2), 62-210.200(228) and 62-210.300, F.A.C.]

*Invent from MODS*  
*Refer to MODS*

4  
A.7. Hours of Operation: The permittee is authorized to operate the unit continuously within the limits of the permitted capacities of Condition 3 and the test conditions of Condition 5 of this permit.

OK.

[BACT, Rules 62-4.160(2), 62-210.200(228) and 62-210.300, F.A.C.]

A.8. Test Conditions: Rocket engine test firings shall be restricted to daylight hours (1 hour after sunrise and 1 hour prior to sunset) and only under ambient conditions that provide good dispersion of the exhaust gases in accordance with a Test Plan to be submitted to the Palm Beach County Health Department (PBCHD) for approval prior to the initial test. The Palm Beach County Health Department (PBCHD) may approve non-daylight hour testing on a case-by-case basis.

O.K.

[BACT, Rules 62-4.070(3), F.A.C.]

Emission Limitations and Standards

A.7. Visible Emissions: The permittee shall not allow visible emissions that exceed forty (40) percent opacity from any rocket engine test firing.

[BACT, Rule 62-296.320(4)(b), F.A.C.]

62-212

please visit float away.

Joe  
Koban

A.8. Carbon Monoxide Emissions: Rocket engine test firings shall not result in CO emissions greater than 41.5 tons per minute (2-minute average), 83 tons per 8-hour period, and 1,000 tons per year (12-month rolling total) as determined using the NASA-Lewis chemical equilibrium computer program or equivalent method approved by the Department or the Palm Beach County Health Department.

O.K.

[BACT, Rules 62-4.160(2), 62-210.200(228), and 62-210.300,

F.A.C.]

A.9. BACT Determination: The permittee shall comply with the requirements of Appendix BD of this permit.

[BACT and Rule 62-212.400(5)(c), F.A.C.]

Test Methods and Procedures.

A.10. Visible Emissions: All visible emissions tests performed pursuant to the requirements of this permit shall comply with the following provisions:

(i). Test Method: The test method for visible emissions shall be DEP Method 9, incorporated in Rule 62-297.401(9)(c), F.A.C. The required minimum period of observation for a compliance test shall for operations that are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the operation completion time. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur.

[BACT, Rule 62-297.310(4)(a)2.a, F.A.C.]

(ii). Test Procedures: Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C.

[Rule 62-296.410(3)(c), F.A.C.]

A.11. Carbon Monoxide Emissions: The permittee shall, prior to any rocket engine test firings, establish an ambient air quality monitoring program to measure ambient air concentrations of CO before, during, and after a rocket engine test firing. The program shall be approved by the Palm Beach County Health Department (PBCHD) and may be discontinued upon written request and PBCHD approval following a minimum of four test firings.

New

A.12. Initial Compliance Demonstrations: The permittee shall conduct a visible emissions compliance test during the initial rocket engine test firing and each subsequent test firing when a ~~new~~ oxidant/fuel ratio is used. Initial compliance with the CO emission limitations shall be demonstrated through compliance with Conditions 8 and 11 of this permit.

FROM  
MODS

lower average

[BACT and Rule 62-297.310(7)(a)1., F.A.C.]

A.13. ~~Continuous~~ Compliance Demonstrations: The permittee shall demonstrate continuous compliance with the CO emissions limitation by use of the ambient air quality monitoring program required by Condition 11 of this permit.

[BACT and Rule 62-4.070(3), F.A.C.]

A.14. <sup>Annual</sup> ~~Renewal~~ Compliance Demonstrations: The permittee shall have a formal compliance test conducted for visible emissions no earlier than 12 months prior to renewal of the Title-V Operating Permit.

[BACT and Rule 62-297.310(7), F.A.C.]

A.15. Flow Monitors: The permittee shall install, maintain, operate and calibrate flow monitors to measure the oxidant and fuel flow rates during each rocket engine test firing. All instrumentation shall be properly, maintained and functional at all times, except during instrument breakdown, calibration or repair to ensure compliance with Conditions 3, 4, 5, and 8 of this permit.

[Rule 62-4.070(3), F.A.C.]

A.16. Recordkeeping: The permittee shall maintain the following records:

- (i). Test Identification Number;
- (ii). Test Date and Time (Start and Finish);
- (iii). Test Duration (Planned and Actual);
- (iv). Oxidant and Fuel Types;
- (v). Oxidant/Fuel Ratio (Planned and Actual);
- (vi). Fuel Usage (gallons per minute);
- (vii). Test Condition Summary;
- (ix). CO Ambient Concentrations;
- (x). <sup>Test Plan Conditions</sup> ~~Mishaps~~ <sup>Excursions</sup>; and
- (xi). Daily and Monthly Totals of Test Duration, Test Firings, and Fuel Usage.

[Rule 62-4.070(3), F.A.C.]

A.17. Reporting: The permittee shall submit the following reports:

(i). Test Notifications: Notification to the PBCHD at least 24 hours prior to a rocket engine test firing. The notification shall include the date and time of the test firing, the expected duration of the test firing, the planned oxidant/fuel ratio, and the planned fuel usage rate.

[BACT and Rule 62-4.070(3), F.A.C.]

(ii) <sup>TCE</sup> ~~Upset~~ Reports: In the event an upset (i.e., test duration > 240 seconds, O/F ratio less than 2.72, fuel usage > 26,500 ~~gallons~~ a flame out, etc.) occurs during a test, a <sup>Violation</sup> ~~Violation~~ report shall be provided to the PBCHD within 24 hours of the test. Within thirty (30) days of an upset, the permittee shall submit an analysis showing the excess emissions associated ambient air quality impacts <sup>if any, if requested</sup>.

[Rule 62-4.130, F.A.C.]

A.18. Excess Emissions: Excess emissions shall be allowed provided the permittee demonstrates that the emissions did not result in a predicted ambient impact greater than the National Ambient Air Quality Standards (NAAQS) for CO adjusted based on the ambient monitoring program; a significant emissions increase in a PSD Pollutant; or result in emissions of a hazardous air pollutant in an amount of 10 tons per year or greater individually or 25 tons per year or greater collectively.

[BACT and Rule 62-4.070(3), F.A.C.]

1. The construction and operation of Emissions Unit 075 shall be in accordance with the capacities and specifications stated in the application. Firing of

See Mops.

OK

Remember

addicted

see mops for TCE. mine

condition A-17

engines shall not exceed 12 tests per year of 240 seconds duration for each test. [Rules 62-210.200, Definitions-Potential to Emit (PTE) and 62-213.440(1)(b)1.b., F.A.C.]

4.1. Operations monitoring records for Emissions Unit 076 shall be maintained as required by 40 C.F.R 60.116b(a) and (b). [Rule 62-4.070(3) and 40 C.F.R. 60.116b]

6. The permittee shall not cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320, F.A.C.]

7. The permittee shall submit an Annual Operating Report to the Department's Southeast District Office and the Palm Beach County Health Department by March 1 of the following year for the previous year's operation. [Rule 62-210.370, F.A.C.]

8. The facility shall adhere to the BACT Determination that is attached as part of this permit following this page. *Out*

*Out?*

Subsection B: The following specific conditions apply to the following emissions units:

Emissions  
Unit No.

Emissions unit Description

076  
NSPS Storage Tank - 36,000 Gallon Capacity

Emissions Units Details

Emissions Unit 076 is a stationary storage tank having an approximate capacity of 36,000 gallons. The tank is subject to specific recordkeeping requirements of 40 CFR 60 Subpart Kb. The tank will store and handle kerosene, a volatile organic liquid (VOL), for the LOX/Kerosene Rocket Engine Test Stand (E.U. ID No. 075).

{Permitting notes: The unit is classified as new facilities under the New Source Performance Standards (40 CFR 60 Subpart Kb) and subject to the recordkeeping requirement of 40 CFR 60 Subpart Kb.}

The following specific conditions apply to the emissions unit(s) listed above:

Operating Restrictions

B.1. Permitted Capacity. The permittee shall not allow, cause, suffer, or permit the operation of Emissions Unit 076 in excess of 318,000 gallons per year without prior authorization from the Permitting Authority: [Rules 62-4.160(2), 62-210.200(228), 62-210.300, F.A.C.]

*See Mod*

B.2. Methods of Operation: The permittee shall not allow, cause, suffer or permit any change in the method of operation of Emissions Unit 076 without prior authorization from the Permitting Authority. The authorized methods of operation include the following:

(i). VOL Type(s): The permittee is authorized to store and handle kerosene.

(ii). VOL Vapor Pressure: The permittee shall not store or handle any fuels within the units with a maximum true vapor pressure greater than 15.0 kPa (2.176 psi).

[Rules 62-4.160(2), 62-210.200(228), 62-210.300, F.A.C., 40 CFR 60.110b(c)]

B.3. Hours of Operation: The permittee is authorized to operate the units continuously.

[Rule 62-4.070(3), F.A.C.]

#### Compliance Demonstrations and Periodic Monitoring

B.4. Compliance Demonstrations: The permittee shall demonstrate compliance with the operating restriction of Condition B.1. based on record keeping as required by Condition B.5. of this permit.

[Rule 62-297.310(7), F.A.C.]

B.5. Records: The permittee shall implement the following periodic monitoring requirements to ensure compliance with the Specific Conditions B.1 and B.2. of this permit:

(i). Monthly Throughput: The permittee shall monitor and record the monthly throughput of volatile organic liquids through each tank.

(ii). Volatile Organic Liquid Types: The permittee shall monitor and record the type (Name and True Vapor Pressure at 80°F) of volatile organic liquids stored and handled in each tank.

[Rule 62-213.440(1)(b), F.A.C.]

#### New Source Performance Standards (NSPS)

(Permitting note: The unit is subject to the recordkeeping requirements of 40 CFR 60 Subpart Kb provided the permittee complies with the requirements of 40 CFR 60.110b, Applicability.)

B.6. 40 CFR 60 Subpart Kb: - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984: The permittee shall comply with the applicable requirements of 40 CFR 60 Subpart Kb contained in Appendix NSPS-Kb. Specifically:

- (i) 40 CFR 60.110b, Applicability,
- (ii) 40 CFR 60.111b, Definitions,
- (iii) 40 CFR 60.116b, Monitoring of Operations

[40 CFR 60.40b(a), Rule 62-204.800(7)(b), F.A.C.]

# Memorandum

# Florida Department of Environmental Protection

---

TO: Clair Fancy

FROM: A. A. Linero

DATE: June 1, 1990

SUBJECT: United Technologies Corp.-Pratt & Whitney  
DEP File No. 0990021-004-AC (PSD-FL-294)  
LOX/Kerosene Rocket Engine Test Stand

Attached for your review and approval is the revised Intent to Issue for the construction of a LOX/Kerosene Rocket Engine Test Stand at the subject facility near in Palm Beach County.

Pratt & Whitney never published notice and instead requested extensions of time to file a petition. We had a teleconference with them in early May and they met with Palm Beach a few days later. We made several changes in the draft package and are ready to send it out again.

Pratt and Whitney has not been in a rush for this permit. They seem to be concerned about many small details that could probably have been ironed during the comment period after public notice.

They asked for another 90-day extension of time on May 17 "to allow P&W and FDEP to complete our work on this permit and resolve these issues without the necessity for a formal hearing."

Let's send out the revised package. I'll let them know we might publish it if they don't.

I recommend your approval and signature.

AAL/

**DRAFT**



**Space Propulsion**

• P. O. Box 109600  
West Palm Beach, FL 33410-9600



**Pratt & Whitney**

A United Technologies Company

CERTIFIED MAIL  
Fax Submittal 850-487-4938

May 14, 2001

Ms. Kathy Carter  
Agency Clerk  
Office of General Counsel  
Florida Department of Environmental Protection  
3900 Commonwealth Boulevard, MS 35  
Tallahassee, FL 32399-3000

**RECEIVED**

MAY 17 2001

BUREAU OF AIR REGULATION

RE: **REQUEST FOR TIME EXTENSION TO FILE PETITION FOR HEARING**  
Pratt & Whitney-Lox-Kerosene Rocket Engine  
DEP File No. 0990021-004-AC (PSD-FL-294)  
OGC Case No. 01-0287

Dear Ms. Carter:

The draft permit for the above-referenced facility in West Palm Beach was issued on January 29, 2001, and received on February 2, 2001, by Pratt & Whitney (P&W). Upon review of the specific permit conditions regarding the rocket test stand, P&W determined that these permit conditions required further discussion with Florida Department of Environmental Protection (FDEP) staff prior to the issuance of the final permit.

Pursuant to Rule 28-106.111, F.A.C., P&W requested an extension to file a petition for hearing under Sections 120.569 and 120.57, F.S. FDEP granted an extension as OGC Case No. 01-0287. This extension is scheduled to expire on May 17, 2001.

Pratt & Whitney has been working with FDEP and Palm Beach County Health Department to finalize the permit conditions on an informal basis. However, due to the proximity of the deadline and the amount of remaining work required to resolve the permit issues, additional time is required. P&W requests additional time to file a petition for hearing.

We believe this request for extension will allow P&W and FDEP to complete our work on this permit and resolve these issues without the necessity for a formal hearing.

Therefore, P&W requests a 90-day extension pursuant to Rule 28-106.111, F.A.C., to file a petition for hearing under Sections 120.569 and 120.57, F.S. We have attached the certificate required under Rule 28-106.111, F.A.C. See **Attachment #1**.

Please contact Mr. Dean Gee at 561-796-2108 or Mr. David Alberghini at 561-796-2448 if you have any questions.

Sincerely,

John K. Sillan  
Deputy Manager  
EH&S and Facilities

Attachment

O:\ehs\windocs\environ\dja\FDEP\_RD180\_xtnd2\_5-01.doc

Cc: A.A. Linero, FDEP  
Benny Susi, P.E., Golder Associates

B.4.2.2.3 LOX/Kerosene Rocket Test Stand

**ATTACHMENT #1**

**CERTIFICATE**

I, John K. Sillan, hereby certify that this extension request was discussed with Mr. Alavaro A. Linero, Administrator; New Source Review Section of the Florida Department of Environmental Protection and that he has no objection to granting an extension.

By John K. Sillan 5/14/01  
John K. Sillan Date  
Deputy Manager  
EH&S and Facilities

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Construction Requirements</b>		
A.1. Test Stand Water cooled silencer – max diam = 20 feet, max length = 80 feet	Dimensions were very preliminary, not based on detailed engineering design	Delete these dimensional restrictions from permit, not relevant to emissions rates
A.2. Oxygen Injection Study - Complete and submit to DEP an engineering and cost study evaluating direct O <sub>2</sub> injection methods and CO emissions reductions	Major effort to perform this type of research study, Estimated effort = 1.5 person-years and > \$300,000; EPA is proposing no controls for MACT	Delete this from permit, on basis of no emissions control per proposed MACT and potential safety issues
<b>Operating Restrictions</b>		
A.3. Permitted capacity Test duration Test firings Oxidant/Fuel Ratio Fuel usage Quench water	All of these conditions were based strictly on permit application submitted Sufficient margin for operations flexibility? "Quench" water is used for sound absorption only, no effect on emissions. Water used by Russians to hide thermal signatures from spy satellites	As long as parameters provide sufficient operating margin, leave in permit Exception – Quench water rates, delete from permit - there is no effect on emissions per calcs, noise suppression only
A.4. Methods of Operation Fuels = kerosene Oxidants = liquid oxygen	Designed to use liquid oxygen and kerosene only	No changes
A.5. Test Conditions Restricted to Daylight hours and Ambient atmospheric conditions that provide good dispersion Nighttime testing allowed on case by case approval basis	NAAQS not exceeded per modeling including all ambient conditions, no reason for restrictions  Will cause test delays if enforced	Modeling results indicate no exceedance is predicted for full range of ambient conditions, no basis for this permit condition exists – therefore delete from permit
A.6. Hours of Operation As limited by A.3 and A.5 conditions described above	Refer to A.3 and A.5 issues	Refer to A.3 and A.5 issues

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Emissions Limitations and Standards</b>		
A.7. Visible emissions Limited to 40% opacity	Photographs of Russian tests show no smoke  Exceedance due to uncombined water (steam) only is not a violation This test is not really intended for operations of short durations	None proposed
A.8. Carbon Monoxide Emissions CO emissions limited on minute (41.5 tons), 8 hour (83 tons), and annual (1000 tons) basis as determined by NASA- Lewis chemical equilibrium computer program or equivalent approved method	Verified results of NASA-Lewis chemical equilibrium computer program	No changes
A.9. BACT Determination Comply with BACT determination portion of permit (Appendix BD)	Eliminate oxygen injection to control CO emissions study. Based on EPA MACT, no emissions control is being proposed	Pratt & Whitney has fulfilled BACT determination as regulatory requirement. BACT was determined to be combustion design (oxidant/fuel ratio) which is integral to the process design, therefore no additional (add on) controls required. Delete oxygen injection study
<b>Test Methods and Procedures</b>		
A.10. Visible Emissions Monitor per DEP Method 9 for duration of the rocket firing test	Method 9 – requires certified “smoke reader” to conduct visible emissions test Can only be performed with adequate natural light	No changes if reg basis is confirmed. Resolve conflict if nighttime testing is performed.

<b>Draft Permit Conditions</b>	<b>Impact / Effects Discussion</b>	<b>Pratt's Proposed Mods</b>
A.11. Carbon Monoxide Emissions Monitoring Establish CO ambient air quality monitoring program for measuring CO before, during and after rocket test firings consistent with quoted EPA guidelines	Ambient air quality monitoring is costly and results are highly dependent on weather conditions. Usefulness of results would be very limited.	Delete this requirement based on marginal usefulness with respect to costs and very small chance that NAAQS would be exceeded.
<b>Compliance Demonstrations and Periodic Monitoring</b>		
A.12. Initial Compliance Demonstrations Visible emissions – monitor opacity during initial firing and for each new oxidant/fuel ratio per Conditions A.8 and A.11 described above	40% opacity limit for visible emissions.	No changes
A.13. Continuous Compliance Demonstrations Use ambient air quality monitoring program (per Condition A.11) to demonstrate CO compliance	Ambient air quality monitoring will not provide accurate compliance info without excessive costs	Delete this requirement
A.14. Annual Compliance Demonstration Formal compliance test for visible emissions once per Federal fiscal year (Oct 1 to Sept 30)	This visible emissions test requirement is redundant if Permit Condition A.12 is met. No regulatory basis found.	Delete this requirement if A.12 is included in permit.  No reg basis.
A.15. Flow Monitors Install and maintain flow monitors for recording oxidant, fuel, and quench water rates during tests	Fuel and oxidant rates will affect emissions rates. Fuel and oxidant rates will be monitored for rocket performance test purposes. Compare maintenance, recordkeeping, and monitoring requirement details of permit vs. rocket tests needs. No regulatory basis for quench water rate measurements exists.	Delete flow monitoring requirements for quench water, no emissions impact.

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<p>A.16. Recordkeeping                      Maintain records for rates, durations, times, test condition summary, ambient CO, etc. as described</p>	<p>Recordkeeping elements directly related to emissions except for ambient CO monitoring.</p>	<p>Delete all ambient air monitoring requirements.</p>
<p>A.17. Reporting                      Test Notifications – provide 24 hour prior notice to PBCHD for each rocket test, including test details                      Mishap Reports – submit written notice within 24 hours and written analysis with 30 days (including excess emissions and ambient air quality impacts, if any)</p>	<p>Will require clear understanding, responsibility guidelines, and close communications between Rocket Test Support staff and EHS to ensure timely and adequate reporting details are provided to agency.</p> <p>No reg basis for Mishap Reports found, stated citation did was not consistent with permit condition</p>	<p>Obtain clear details of reporting requirements including methods (fax, phone, email?) for test notifications.                      Delete requirements regarding ambient air quality impacts – this can only be done via monitoring or modeling, in either case – results are not definitive, i.e., not necessarily representative of actual impacts                      Report mishaps as an “excursion from intended test conditions” with no reference to emissions.</p>
<p>A.18. Excess Emissions                      Excess emissions are allowed provided that Pratt demonstrates that no predicted impacts exceeding the NAAQS CO limit adjusted for ambient air monitoring program, significant increase in PSD pollutants, or HAPS</p>	<p>Any excursions from test conditions that increase emissions will create an Excess Emissions condition by permit definitions.                      Clear demonstration of NAAQS exceedance is difficult/impossible. Similarly for other PSD criteria pollutants and HAPS (results of modeling or ambient air monitoring are not definitive).</p>	<p>Same basis for deletion as described for A.17 above. Pratt &amp; Whitney should report these incidents as an “excursion from intended test conditions” with no reference to excess emissions unless excess emissions were observed or directly measured.</p>

**From:** Darrel\_Graziani@doh.state.fl.us  
**Sent:** Monday, May 21, 2001 12:58 PM  
**To:** Linero, Alvaro  
**Cc:** Jim\_Stormer@doh.state.fl.us  
**Subject:** Pratt & Whitney PSD Permit

Al,

Jim and I met with the Pratt people and consultants and agreed to the following changes:

Page TE-13:

The monitoring program shall be established prior to the initial test firing and shall ~~continue for a minimum of 12 valid test runs~~ provide for the collection of data for a minimum of four (4) test firings, one in each calendar quarter. ~~A valid test run shall be deemed one in which the wind direction will position at least one monitoring station downwind.~~ The program will allow the applicant to discontinue monitoring upon approval of the PBCHD during extended periods when testing is not scheduled.

Page 2, AC Permit - Condition A.3.(v).

All rocket engine test firings shall be conducted with ~~a minimum~~ the maximum quench water flow possible. ~~of 3,220 gallons per second.~~

Page 2, AC Permit - Condition A.7.

Al, since you're not setting the limit at 20% opacity you will need to change the rule quote.

Page 3, AC Permit - Condition A.11.

The permittee shall, prior to any rocket engine test firings, establish an approved ambient air quality monitoring program to measure ambient air concentrations of CO before, during, and after a rocket engine test firing. The program shall be approved by the Palm Beach County Health Department (PBCHD) and may be discontinued upon written request and PBCHD approval. ~~completion of consistent with the procedures specified in the Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA 450/4-87-007, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N. C. 27711, May 1987).~~

Page 3, AC Permit - Condition A.12.

The permittee shall have conduct a visible emissions compliance test during the initial rocket engine test firing ~~and each subsequent test firing when a new oxidant/fuel ratio is used.~~ Initial compliance with the CO emission limitations shall be demonstrated through compliance with **Conditions 8 and 11** of this permit.

Page 4, AC Permit - Condition A.14.

**Annual Renewal Compliance Demonstrations:** The permittee shall have a formal compliance test conducted for visible emissions no earlier than 12 months prior to renewal of the Title V Operating Permit ~~annually during each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, order, or permit.~~

*( Al - The rule requires that an annual test be conducted since there is a limit. If it was just the 20% opacity of the General VE Rule it might not be required.)*

Page 4, AC Permit - Condition A.15.

The permittee shall install, maintain, operate and calibrate flow monitors to measure the oxidant

and; ~~fuel and quench water~~ flow rates during each rocket engine test firing. All instrumentation shall be properly maintained and functional at all times, except during instrument breakdown, calibration or repair to ensure compliance with **Conditions 3, 4, 5, and 8** of this permit.

Page 4, AC Permit - Condition A.16.(vii).

~~(vii). Quench Water Rate (Planned and Actual);~~

Page 4, AC Permit - Condition A.17.(ii).

**Mishap Upset Reports:** In the event an ~~upset-a mishap~~ (i.e., test duration > 240 seconds, O/F ratio less than 2.72, fuel usage > 13,250 gpm, a flame out, ect.) occurs during a test, a written report shall be provided to the PBCHD within 24 hours of the test. Within thirty (30) days of an ~~upset-a mishap~~, the permittee shall submit an analysis showing the excess emissions associated ambient air quality impacts, if any.

Darrel



**SUBSECTION A:** The following specific conditions apply to the following emissions units:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
075	LOX/Kerosene Rocket Engine Test Stand

**EMISSIONS UNIT(S) DETAILS**

LOX/Kerosene Rocket Engine Test Stand, designated Emissions Unit 075, consisting of an engine containment can, a water-cooled silencer, and an exhaust gas deflector. Emissions are controlled through the use of a minimum oxidant to fuel ratio and the water-cooled silencer.

{Permitting note(s): The emissions unit has been reviewed under the PSD Program for carbon monoxide (CO). As a new major source of CO, the emissions unit is subject to the Best Available Control Technology (BACT) requirements of Rule 62-212.400(5)(c), F.A.C. Potential emissions of particulate matter (PM and PM10), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), and volatile organic compounds have been estimated at 2.3, 1.4, 1.4, and 2.9 tons per year, respectively. The emissions unit is not subject to any New Source Performance Standards (40 CFR Part 60) or National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61). The emissions unit has been identified as a Source Category for future regulatory action under the National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR Part 63). A case-by-case determination of the Maximum Achievable Control Technology (MACT) under 40 CFR Part 63, Subpart B was not required.}

**CONSTRUCTION REQUIREMENTS**

- A.1. **Test Stand:** The test stand shall be constructed in accordance with the design specifications provided within the application and the following minimum and maximum specifications:
  - (i) ~~**Water Cooled Silencer:** Maximum diameter of 20 feet and a maximum length of 80 feet; and~~
  - (ii) **Exhaust Gas Deflector:** Minimum height of 70 feet, maximum distance from Water Cooled Silencer of 100 feet. The surface between the water-cooled silencer and the exhaust gas deflector shall be paved.

[BACT and Rules 62-4.070(3) and 62-296.320(4)(c), F.A.C.]

- A.2. **Oxygen Injection Study:** Within one year of initial issuance of this permit, the permittee shall complete and submit to the Department an engineering and cost study evaluating the technical feasibility and cost effectiveness of direct O<sub>2</sub> (~~Air or Pure Oxygen~~) injection for reducing CO emissions in the exhausts of rocket engines tested at the permittee's facility. The study shall evaluate possibilities for direct O<sub>2</sub> injection including a heat-shielded, internally cooled oxygen lance for injecting stoichiometric rates of oxygen into the exhaust downstream of the engine. Appropriate kinetic modeling shall be utilized to predict the oxidation reaction rates and overall CO conversion for various configurations of the injection apparatus and various injection locations and methods.

[Rule 62-4.070(3) and BACT]

**OPERATING RESTRICTIONS**

- A.3. **Permitted Capacity:** The permittee shall not allow, cause, suffer or permit the operation of the unit in excess of the following capacities without prior authorization from the Permitting Authority:
  - (i) **Test Duration:** Rocket engine test firing duration shall not exceed a total of 240 seconds per 8-hour period.

- (ii). **Test Firings:** Rocket engine test firings shall not exceed 2,880 seconds per year (12-month rolling total).
- (iii). **Oxidant/Fuel Ratio:** All rocket engine test firings shall be conducted at a minimum oxidant/fuel ratio of 2.72 pounds of oxygen per pound of fuel.
- (iv). **Fuel Usage:** Rocket engine test firings shall not consume more than 6,625 gallons per minute (4-minute average), 26,500 gallons per 8-hour period, and 318,000 gallons per year (12-month rolling total).
- (v). ~~**Quench Water:** All rocket engine test firings shall be conducted with a minimum quench water flow of 3,220 gallons per second.~~

[BACT, Rules 62-4.160(2), 62-210.200(228), and 62-210.300, F.A.C.]

{Permitting note: Prior authorization includes the issuance of construction, reconstruction, or modification permits or a determination by the Permitting Authority that the action is not subject to 62-210.300(1), F.A.C.}

A.4. **Methods of Operation:** The permittee shall not allow, cause, suffer or permit any change in the method(s) of operation resulting in increased short-term or long-term potential emissions, without prior authorization from the Permitting Authority. The authorized methods of operation include the following:

- (i) **Fuels:** The permittee is authorized to use kerosene as the rocket engine fuel.
- (ii). **Oxidants:** The permittee is authorized to use liquid oxygen (LOX) as the rocket engine fuel oxidizer.

[BACT, Rules 62-4.160(2), 62-210.200(228) and 62-210.300, F.A.C.]

~~A.5. **Test Conditions:** Rocket engine test firings shall be restricted to daylight hours (1 hour after sunrise and 1 hour prior to sunset) and only under ambient conditions that provide good dispersion of the exhaust gases in accordance with a Test Plan to be submitted to the Palm Beach County Health Department (PBCHD) for approval prior to the initial test. Non-daylight hour testing may be approved on a case-by-case basis by the Palm Beach County Health Department (PBCHD).~~

~~[BACT, Rules 62-4.070(3), F.A.C.]~~

A.56. **Hours of Operation:** The permittee is authorized to operate the unit continuously within the limits of the permitted capacities of **Condition 3** and the test conditions of **Condition 5** of this permit.

[BACT, Rules 62-4.160(2), 62-210.200(228) and 62-210.300, F.A.C.]

**EMISSION LIMITATIONS AND STANDARDS**

A.67. **Visible Emissions:** The permittee shall not allow visible emissions that exceed forty (40) percent opacity from any rocket engine test firing.

[BACT, Rule 62-296.320(4)(b), F.A.C.]

A. ~~78~~. **Carbon Monoxide Emissions:** Rocket engine test firings shall not result in CO emissions greater than 41.5 tons per minute (2-minute average), 83 tons per 8-hour period, and 1,000 tons per year (12-month rolling total) as determined using the NASA-Lewis chemical equilibrium computer program or equivalent method approved by the Department or the Palm Beach County Health Department.

[BACT, Rules 62-4.160(2), 62-210.200(228), and 62-210.300, F.A.C.]

A. ~~89~~. **BACT Determination:** The permittee shall comply with the requirements of Appendix BD of this permit.

[BACT and Rule 62-212.400(5)(c), F.A.C.]

#### **TEST METHODS AND PROCEDURES.**

A. ~~90~~. **Visible Emissions:** All visible emissions tests performed pursuant to the requirements of this permit shall comply with the following provisions:

(i). **Test Method:** The test method for visible emissions shall be DEP Method 9, incorporated in Rule 62-297.401(9)(c), F.A.C. The required minimum period of observation for a compliance test shall for operations that are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the operation completion time. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur.

[BACT, Rule 62-297.310(4)(a)2.a, F.A.C.]

(ii). **Test Procedures:** Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C.

[Rule 62-296.410(3)(c), F.A.C.]

A. ~~1011~~. **Carbon Monoxide Emissions:** The permittee shall, prior to any rocket engine test firings, establish an ambient air quality monitoring program to measure ambient air concentrations of CO before, during, and after a rocket engine test firing. The program shall be consistent with the procedures specified in the Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA 450/4-87-007, U. S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N. C. 27711, May 1987).

#### **COMPLIANCE DEMONSTRATIONS AND PERIODIC MONITORING**

A. ~~1112~~. **Initial Compliance Demonstrations:** The permittee shall conduct a visible emissions compliance test during the initial rocket engine test firing and each subsequent test firing when a new oxidant/fuel ratio is used. Initial compliance with the CO emission limitations shall be demonstrated through compliance with **Conditions ~~78~~ and ~~1011~~** of this permit.

[BACT and Rule 62-297.310(7)(a)1., F.A.C.]

A. ~~1213~~. **Continuous Compliance Demonstrations:** The permittee shall demonstrate continuous compliance with the CO emissions limitation by use of the ambient air quality monitoring program required by **Condition ~~1011~~** of this permit.

[BACT and Rule 62-4.070(3), F.A.C.]

A. ~~1314~~. **Annual Compliance Demonstrations:** The permittee shall have a formal compliance test conducted for visible emissions annually during each federal fiscal year (October 1 – September 30), unless otherwise specified by rule, order, or permit.

[BACT and Rule 62-297.310(7), F.A.C.]

A.15. **Flow Monitors:** The permittee shall install, maintain, operate and calibrate flow monitors to measure the oxidant, ~~and~~ fuel ~~and quench water~~ flow rates during each rocket engine test firing. All instrumentation shall be properly maintained and functional at all times, except during instrument breakdown, calibration or repair to ensure compliance with **Conditions 3, 4, 5, and 7** of this permit.

[Rule 62-4.070(3), F.A.C.]

A.16. **Recordkeeping:** The permittee shall maintain the following records:

- (i). Test Identification Number;
- (ii). Test Date and Time (Start and Finish);
- (iii). Test Duration (Planned and Actual);
- (iv). Oxidant and Fuel Types;
- (v). Oxidant/Fuel Ratio (Planned and Actual);
- (vi). Fuel Usage (gallons per minute);
- (vii). Quench Water Rate (Planned and Actual);
- (viii). Test Condition Summary;
- (ix). CO Ambient Concentrations;
- (x). Mishaps; and
- (xi). Daily and Monthly Totals of Test Duration, Test Firings, and Fuel Usage.

[Rule 62-4.070(3), F.A.C.]

A.17. **Reporting:** The permittee shall submit the following reports:

- (i). **Test Notifications:** Notification to the PBCHD at least 24 hours prior to a rocket engine test firing. The notification shall include the date and time of the test firing, the expected duration of the test firing, the planned oxidant/fuel ratio, and the planned fuel usage rate.

[BACT and Rule 62-4.070(3), F.A.C.]

- (ii) **Mishap Reports:** In the event a mishap (i.e., test duration > 240 seconds, O/F ratio less than 2.72, fuel usage > 13,250 gpm, a flame out, etc.) occurs during a test, a written report shall be provided to the PBCHD within 24 hours of the test. Within thirty (30) days of a mishap, the permittee shall submit an analysis showing the excess emissions associated ambient air quality impacts, if any.

[Rule 62-4.130, F.A.C.]

A.18. **Excess Emissions:** Excess emissions shall be allowed provided the permittee demonstrates that the emissions did not result in a predicted ambient impact greater than the National Ambient Air Quality Standards (NAAQS) for CO adjusted based on the ambient monitoring program; a significant emissions increase in a PSD Pollutant; or result in emissions of a hazardous air pollutant in an amount of 10 tons per year or greater individually or 25 tons per year or greater collectively.

[BACT and Rule 62-4.070(3), F.A.C.]

**SUBSECTION B:** The following specific conditions apply to the following emissions units:

<b>EMISSIONS UNIT NO.</b>	<b>EMISSIONS UNIT DESCRIPTION</b>
076	NSPS Storage Tank – 36,000 Gallon Capacity

**EMISSIONS UNITS DETAILS**

Emissions Unit 076 is a stationary storage tank ~~each~~ having an approximate capacity of 36,000 gallons. The tank is subject to specific recordkeeping requirements of 40 CFR 60 Subpart Kb. The tank will store and handle kerosene, a volatile organic liquid (VOL), for the LOX/Kerosene Rocket Engine Test Stand (E.U. ID No. 075).

{Permitting notes: The unit is classified as new facilities under the New Source Performance Standards (40 CFR 60 Subpart Kb) and subject to the recordkeeping requirement of 40 CFR 60 Subpart Kb.}

**The following specific conditions apply to the emissions unit(s) listed above:**

**OPERATING RESTRICTIONS**

- B.1. **Permitted Capacity:** The permittee shall not allow, cause, suffer, or permit the operation of Emissions Unit 076 in excess of 318,000 gallons per year without prior authorization from the Permitting Authority:  
[Rules 62-4.160(2), 62-210.200(228), 62-210.300, F.A.C.]
- B.2. **Methods of Operation:** The permittee shall not allow, cause, suffer or permit any change in the method of operation of Emissions Unit 076 without prior authorization from the Permitting Authority. The authorized methods of operation include the following:
  - (i). **VOL Type(s):** The permittee is authorized to store and handle kerosene.
  - (ii). **VOL Vapor Pressure:** The permittee shall not store or handle any fuels within the units with a maximum true vapor pressure greater than 15.0 kPa (2.176 psi).  
[Rules 62-4.160(2), 62-210.200(228), 62-210.300, F.A.C., 40 CFR 60.110b(c)]
- B.3. **Hours of Operation:** The permittee is authorized to operate the units continuously.  
[Rule 62-4.070(3), F.A.C.]

**COMPLIANCE DEMONSTRATIONS AND PERIODIC MONITORING**

- B.4. **Compliance Demonstrations:** The permittee shall demonstrate compliance with the operating restriction of Condition B.1. based on record keeping as required by Condition B.5. of this permit.  
[Rule 62-297.310(7), F.A.C.]
- B.5. **Records:** The permittee shall implement the following periodic monitoring requirements to ensure compliance with the Specific Conditions B.1 and B.2. of this permit:
  - (i). **Monthly Throughput:** The permittee shall monitor and record the monthly throughput of volatile organic liquids through each tank.
  - (ii). **Volatile Organic Liquid Types:** The permittee shall monitor and record the type (Name and True Vapor Pressure at 80°F) of volatile organic liquids stored and handled in each tank.  
[Rule 62-213.440(1)(b), F.A.C.]

## APPENDIX BD - BACT DETERMINATION

to evaluate the feasibility of direct O<sub>2</sub> injection into the gas stream downstream of the body of the engine. The study should employ kinetic modeling to determine the practicability and economic feasibility of adding the balance of stoichiometric oxygen required for complete combustion via direct injection at an appropriate point or points in the rocket engine exhaust. A period of one year is provided for completion of the study and submitting it to the Department.

The Department agrees with the applicant's finding that existing oxidation technology is not feasible at this time. As a result, the Department has determined BACT for the rocket engine test stand to be a visible emissions limitation of forty (40) percent opacity and the following work practices:

- Carbon Monoxide (CO) Emissions – Rocket engine test firings shall not result in CO emissions greater than 41.5 tons per minute (2-minute average), 83 tons per 8-hour period, and 1,000 tons per year (12-month rolling total) as determined using the NASA-Lewis chemical equilibrium computer program or equivalent method approved by the Department, *or the Palm Beach County Health Department.*
- Test Stand - The test stand shall be constructed in accordance with the design specifications provided within the application including a Water Cooled Silencer ~~with a maximum diameter of 20 feet and a maximum length of 80 feet~~ and an Exhaust Gas Deflector with a Minimum height of 70 feet, maximum distance from Water Cooled Silencer of 100 feet. The surface between the water-cooled silencer and the exhaust gas deflector shall be paved.
- Test Duration – Rocket engine test firings shall not exceed a total of 240 seconds per 8-hour period.
- Test Firings – Rocket engine test firings shall not exceed 2,880 seconds per year (12-month rolling total).
- Oxidant/Fuel Ratio – All rocket engine test firings shall be conducted at a minimum oxidant/fuel ratio of 2.72 lb. O<sub>2</sub>/lb. Fuel.
- Fuel Usage – Rocket engine test firings shall not consume more than 6,625 gallons per minute (4-minute average), 26,500 gallons per 8-hour period, and 318,000 gallons per year (12-month rolling total).
- ~~Quench Water – All rocket engine test firings shall be conducted with sufficient quench water to minimize NO<sub>x</sub> formation.~~
- Fuel and Oxidizer Types - Rocket engine test firings shall be limited to the firing of kerosene as the fuel and liquid oxygen (LOX) as the oxidizer.
- Test Conditions – Rocket engine test firings shall be restricted to daylight hours (1 hour after sunrise and 1 hour prior to sunset) and only under ambient conditions that provide good dispersion of the exhaust gases in accordance with a Test Plan to be submitted to the Palm Beach County Health Department (PBCHD) for approval prior to the initial test. Non-daylight hour testing may be approved on a case-by-case basis by the Palm Beach County Health Department (PBCHD).

## APPENDIX BD - BACT DETERMINATION

- Test Notifications – At least 24 hours prior to a rocket engine test firing, notification shall be provided to the PBCHD. The notification shall include the date and time of the test firing, the expected duration of the test firing, the planned oxidant/fuel ratio, and the planned fuel usage rate. In the event that an upset occurs during a test (i.e., test duration > 240 seconds, O/F ratio less than 2.72, fuel usage > 13,250 gpm, a flame out, etc.), a written excess emissions report shall be provided to the PBCHD within 24 hours of the test. The report shall identify the upset and impacts.
- Postconstruction Monitoring – The permittee shall, prior to any rocket test firings, establish an approved ambient air quality monitoring program to measure ambient air concentrations of CO before, during, and after a rocket engine test firing. The Program shall be approved by the Palm Beach County Health Department (PBCHD) and may be discontinued upon written request and PBCHD approval. *consistent with the procedures specified in the Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA 450/4-87-007 U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27111, 1998) May 1998*
- Oxygen Injection Study – Within one year of initial issuance of this permit, the permittee shall complete and submit to the Department an engineering and cost study evaluating the technical feasibility and cost effectiveness of direct O<sub>2</sub> (~~Air or Pure Oxygen~~) injection for reducing CO emissions in the exhausts of rocket engines tested at the permittee's facility. The study shall evaluate possibilities for direct O<sub>2</sub> injection including a heat-shielded, internally-cooled oxygen lance for injecting stoichiometric rates of oxygen into the exhaust downstream of the engine. Appropriate kinetic modeling shall be utilized to predict the oxidation reaction rates and overall CO conversion for various configurations of the injection apparatus and various injection locations and methods.
- Compliance Demonstrations – Compliance with the visible emissions limitation shall be demonstrated initially for each new oxidant/fuel ratio and <sup>f</sup>annually thereafter. Compliance with the CO emissions limitation shall be demonstrated initially and continuously thereafter through the use of the NASA Lewis chemical equilibrium computer program or its equivalent as approved by the Department of <sup>the</sup>Palm Beach County Health Department and the ambient air quality monitoring program.
- Excess Emissions - Excess emissions shall be allowed provided the permittee demonstrates that the emissions did not result in a predicted ambient impact greater than the National Ambient Air Quality Standards (NAAQS) for CO adjusted based on the ambient monitoring program; a significant emissions increase in a PSD Pollutant; or result in emissions of a hazardous air pollutant in an amount of 10 tons per year or greater individually or 25 tons per year or greater collectively.

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Construction Requirements</b>		
A.1. Test Stand Water cooled silencer – max diam = 20 feet, max length = 80 feet	Dimensions were very preliminary, not based on detailed engineering design	Delete these dimensional restrictions from permit, not relevant to emissions rates
A.2. Oxygen Injection Study - Complete and submit to DEP an engineering and cost study evaluating direct O <sub>2</sub> injection methods and CO emissions reductions	Major effort to perform this type of research study, Estimated effort = 1.5 person-years and > \$300,000; EPA is proposing no controls for MACT	Delete this from permit, on basis of no emissions control per proposed MACT and potential safety issues
<b>Operating Restrictions</b>		
A.3. Permitted capacity Test duration Test firings Oxidant/Fuel Ratio Fuel usage Quench water	All of these conditions were based strictly on permit application submitted Sufficient margin for operations flexibility? "Quench" water is used for sound absorption only, no effect on emissions. Water used by Russians to hide thermal signatures from spy satellites	As long as parameters provide sufficient operating margin, leave in permit Exception – Quench water rates, delete from permit - there is no effect on emissions per calcs, noise suppression only
A.4. Methods of Operation Fuels = kerosene Oxidants = liquid oxygen	Designed to use liquid oxygen and kerosene only	No changes
A.5. Test Conditions Restricted to Daylight hours and Ambient atmospheric conditions that provide good dispersion Nighttime testing allowed on case by case approval basis	NAAQS not exceeded per modeling including all ambient conditions, no reason for restrictions  Will cause test delays if enforced	Modeling results indicate no exceedance is predicted for full range of ambient conditions, no basis for this permit condition exists – therefore delete from permit
A.6. Hours of Operation As limited by A.3 and A.5 conditions described above	Refer to A.3 and A.5 issues	Refer to A.3 and A.5 issues

*memor  
to be  
submitted  
outlining  
approach*

*Remove  
quench  
rates*

*Clarify  
2.4 vs. 2.72*

*All consulted  
Darryl  
(Related  
to Soviet launch  
in dusting,  
Palm Beach  
County)*



Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Emissions Limitations and Standards</b>		
A.7. Visible emissions Limited to 40% opacity <i>20%?</i>	Photographs of Russian tests show no smoke  Exceedance due to uncombined water (steam) only is not a violation This test is not really intended for operations of short durations	None proposed
A.8. Carbon Monoxide Emissions CO emissions limited on minute (41.5 tons), 8 hour (83 tons), and annual (1000 tons) basis as determined by NASA-Lewis chemical equilibrium computer program or equivalent approved method	Verified results of NASA-Lewis chemical equilibrium computer program	No changes
A.9. BACT Determination Comply with BACT determination portion of permit (Appendix BD)	Eliminate oxygen injection to control CO emissions study. Based on EPA MACT, no emissions control is being proposed	Pratt & Whitney has fulfilled BACT determination as regulatory requirement. BACT was determined to be combustion design (oxidant/fuel ratio) which is integral to the process design, therefore no additional (add on) controls required. Delete oxygen injection study
<b>Test Methods and Procedures</b>		
A.10. Visible Emissions Monitor per DEP Method 9 for duration of the rocket firing test	Method 9 - requires certified "smoke reader" to conduct visible emissions test Can only be performed with adequate natural light	No changes if reg basis is confirmed. Resolve conflict if nighttime testing is performed.
A.11. Carbon Monoxide Emissions Monitoring Establish CO ambient air quality monitoring program for measuring CO before, during and after rocket test firings consistent with quoted EPA guidelines	Ambient air quality monitoring is costly and results are highly dependent on weather conditions. Usefulness of results would be very limited.	Delete this requirement based on marginal usefulness with respect to costs and very small chance that NAAQS would be exceeded.

*SAME AS A.2.*

*Consult with Perry*

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Compliance Demonstrations and Periodic Monitoring</b>		
A.12. Initial Compliance Demonstrations Visible emissions – monitor opacity during initial firing and for each new oxidant/fuel ratio per Conditions A.8 and A.11 described above	40% opacity limit for visible emissions.	No changes
A.13. Continuous Compliance Demonstrations Use ambient air quality monitoring program (per Condition A.11) to demonstrate CO compliance	Ambient air quality monitoring will not provide accurate compliance info without excessive costs	Delete this requirement
A.14. Annual Compliance Demonstration Formal compliance test for visible emissions once per Federal fiscal year (Oct 1 to Sept 30)	This visible emissions test requirement is redundant if Permit Condition A.12 is met. No regulatory basis found.	Delete this requirement if A.12 is included in permit.  No reg basis.
A.15. Flow Monitors Install and maintain flow monitors for recording oxidant, fuel, and quench water rates during tests	Fuel and oxidant rates will affect emissions rates. Fuel and oxidant rates will be monitored for rocket performance test purposes. Compare maintenance, recordkeeping, and monitoring requirement details of permit vs. rocket tests needs. No regulatory basis for quench water rate measurements exists.	Delete flow monitoring requirements for quench water, no emissions impact.
A.16. Recordkeeping Maintain records for rates, durations, times, test condition summary, ambient CO, etc. as described	Recordkeeping elements directly related to emissions except for ambient CO monitoring.	Delete all ambient air monitoring requirements.

*Discontinue w/ permit*

*Change to not formal since 2004*

*B.K.*

*Check  
w/ Perry*

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<p>A.17. Reporting                      Test Notifications – provide 24 hour prior notice to PBCHD for each rocket test, including test details                      Mishap Reports – submit written notice within 24 hours and written analysis with 30 days (including excess emissions and ambient air quality impacts, if any)</p>	<p>Will require clear understanding, responsibility guidelines, and close communications between Rocket Test Support staff and EHS to ensure timely and adequate reporting details are provided to agency.</p> <p>No reg basis for Mishap Reports found, stated citation did was not consistent with permit condition</p>	<p>Obtain clear details of reporting requirements including methods (fax, phone, email?) for test notifications.                      Delete requirements regarding ambient air quality impacts – this can only be done via monitoring or modeling, in either case – results are not definitive, i.e., not necessarily representative of actual impacts                      Report mishaps as an “excursion from intended test conditions” with no reference to emissions.</p>
<p>A.18. Excess Emissions                      Excess emissions are allowed provided that Pratt demonstrates that no predicted impacts exceeding the NAAQS CO limit adjusted for ambient air monitoring program, significant increase in PSD pollutants, or HAPS</p>	<p>Any excursions from test conditions that increase emissions will create an Excess Emissions condition by permit definitions.                      Clear demonstration of NAAQS exceedance is difficult/impossible. Similarly for other PSD criteria pollutants and HAPS (results of modeling or ambient air monitoring are not definitive).</p>	<p>Same basis for deletion as described for A.17 above. Pratt &amp; Whitney should report these incidents as an “excursion from intended test conditions” with no reference to excess emissions unless excess emissions were observed or directly measured.</p>

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
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A.1. Test Stand Water cooled silencer – max diam = 20 feet, max length = 80 feet	Dimensions were very preliminary, not based on detailed engineering design	Delete these dimensional restrictions from permit, not relevant to emissions rates
A.2. Oxygen Injection Study - Complete and submit to DEP an engineering and cost study evaluating direct O <sub>2</sub> injection methods and CO emissions reductions	Major effort to perform this type of research study, Estimated effort = 1.5 person-years and > \$300,000; EPA is proposing no controls for MACT	Delete this from permit, on basis of no emissions control per proposed MACT and potential safety issues
<b>Operating Restrictions</b>		
A.3. Permitted capacity Test duration Test firings Oxidant/Fuel Ratio Fuel usage Quench water	All of these conditions were based strictly on permit application submitted Sufficient margin for operations flexibility? "Quench" water is used for sound absorption only, no effect on emissions. Water used by Russians to hide thermal signatures from spy satellites	As long as parameters provide sufficient operating margin, leave in permit. Exception – Quench water rates, delete from permit - there is no effect on emissions per calcs, noise suppression only
A.4. Methods of Operation Fuels = kerosene Oxidants = liquid oxygen	Designed to use liquid oxygen and kerosene only	No changes
A.5. Test Conditions Restricted to Daylight hours and Ambient atmospheric conditions that provide good dispersion. Nighttime testing allowed on case by case approval basis	NAAQS not exceeded per modeling including all ambient conditions, no reason for restrictions  Will cause test delays if enforced	Modeling results indicate no exceedance is predicted for full range of ambient conditions, no basis for this permit condition exists – therefore delete from permit
A.6. Hours of Operation As limited by A.3 and A.5 conditions described above	Refer to A.3 and A.5 issues	Refer to A.3 and A.5 issues

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Emissions Limitations and Standards</b>		
A.7. Visible emissions Limited to 40% opacity	Photographs of Russian tests show no smoke  Exceedance due to uncombined water (steam) only is not a violation This test is not really intended for operations of short durations	None proposed
A.8. Carbon Monoxide Emissions CO emissions limited on minute (41.5 tons), 8 hour (83 tons), and annual (1000 tons) basis as determined by NASA-Lewis chemical equilibrium computer program or equivalent approved method	Verified results of NASA-Lewis chemical equilibrium computer program	No changes
A.9. BACT Determination Comply with BACT determination portion of permit (Appendix BD)	Eliminate oxygen injection to control CO emissions study. Based on EPA MACT, no emissions control is being proposed	Pratt & Whitney has fulfilled BACT determination as regulatory requirement. BACT was determined to be combustion design (oxidant/fuel ratio) which is integral to the process design, therefore no additional (add on) controls required. Delete oxygen injection study
<b>Test Methods and Procedures</b>		
A.10. Visible Emissions Monitor per DEP Method 9 for duration of the rocket firing test	Method 9 – requires certified “smoke reader” to conduct visible emissions test Can only be performed with adequate natural light	No changes if reg basis is confirmed. Resolve conflict if nighttime testing is performed.
A.11. Carbon Monoxide Emissions Monitoring Establish CO ambient air quality monitoring program for measuring CO before, during and after rocket test firings consistent with quoted EPA guidelines	Ambient air quality monitoring is costly and results are highly dependent on weather conditions. Usefulness of results would be very limited.	Delete this requirement based on marginal usefulness with respect to costs and very small chance that NAAQS would be exceeded.

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<b>Compliance Demonstrations and Periodic Monitoring</b>		
A.12. Initial Compliance Demonstrations Visible emissions – monitor opacity during initial firing and for each new oxidant/fuel ratio per Conditions A.8 and A.11 described above	40% opacity limit for visible emissions.	No changes
A.13. Continuous Compliance Demonstrations Use ambient air quality monitoring program (per Condition A.11) to demonstrate CO compliance	Ambient air quality monitoring will not provide accurate compliance info without excessive costs	Delete this requirement
A.14. Annual Compliance Demonstration Formal compliance test for visible emissions once per Federal fiscal year (Oct 1 to Sept 30)	This visible emissions test requirement is redundant if Permit Condition A.12 is met. No regulatory basis found.	Delete this requirement if A.12 is included in permit. No reg basis. *
A.15. Flow Monitors Install and maintain flow monitors for recording oxidant, fuel, and quench water rates during tests	Fuel and oxidant rates will affect emissions rates. Fuel and oxidant rates will be monitored for rocket performance test purposes. Compare maintenance, recordkeeping, and monitoring requirement details of permit vs. rocket tests needs. No regulatory basis for quench water rate measurements exists.	Delete flow monitoring requirements for quench water, no emissions impact. *
A.16. Recordkeeping Maintain records for rates, durations, times, test condition summary, ambient CO, etc. as described	Recordkeeping elements directly related to emissions except for ambient CO monitoring.	Delete all ambient air monitoring requirements.

Draft Permit Conditions	Impact / Effects Discussion	Pratt's Proposed Mods
<p>A.17. Reporting Test Notifications – provide 24 hour prior notice to PBCHD for each rocket test, including test details                      Mishap Reports – submit written notice within 24 hours and written analysis with 30 days (including excess emissions and ambient air quality impacts, if any)</p>	<p>Will require clear understanding, responsibility guidelines, and close communications between Rocket Test Support staff and EHS to ensure timely and adequate reporting details are provided to agency.</p> <p>No reg basis for Mishap Reports found, stated citation did was not consistent with permit condition</p>	<p>Obtain clear details of reporting requirements including methods (fax, phone, email?) for test notifications.                      Delete requirements regarding ambient air quality impacts – this can only be done via monitoring or modeling, in either case – results are not definitive, i.e., not necessarily representative of actual impacts                      Report mishaps as an “excursion from intended test conditions” with no reference to emissions.</p>
<p>A.18. Excess Emissions                      Excess emissions are allowed provided that Pratt demonstrates that no predicted impacts exceeding the NAAQS CO limit adjusted for ambient air monitoring program, significant increase in PSD pollutants, or HAPS</p>	<p>Any excursions from test conditions that increase emissions will create an Excess Emissions condition by permit definitions.                      Clear demonstration of NAAQS exceedance is difficult/impossible. Similarly for other PSD criteria pollutants and HAPS (results of modeling or ambient air monitoring are not definitive).</p>	<p>Same basis for deletion as described for A.17 above. Pratt &amp; Whitney should report these incidents as an “excursion from intended test conditions” with no reference to excess emissions unless excess emissions were observed or directly measured.</p>



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

RECEIVED

MAR 14 2001

4 APT-ARB

MAR 12 2001

BUREAU OF AIR REGULATION

Mr. A. A. Linero, P.E.  
Administrator  
New Source Review Section  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

SUBJ: Prevention of Significant Deterioration (PSD) Preliminary Determination for United Technologies Corporation (UTC) - Pratt & Whitney located in Jupiter (Palm Beach County), Florida  
PSD-FL-294

Dear Mr. Linero:

Thank you for submitting the PSD preliminary determination (dated January 29, 2001) for the above referenced facility to the U.S. Environmental Protection Agency (EPA) for comments. The proposed project involves the construction and operation of a test cell for liquid oxygen (LOX)/kerosene-propelled rocket engines at the E-5 rocket test area of the existing West Palm Beach facility. The new test cell will consist of the following systems: LOX and kerosene supply tanks (64,000 and 36,000-gallon capacities, respectively), engine containment can, water-cooled silencer, exhaust gas deflector, lined cooling water retention pond, and elevated water supply tank (1 million-gallon capacity). The total emissions increase of carbon monoxide (CO) from the proposed project is above the significance threshold requiring PSD review.

Based on a review of the preliminary determination, it appears that the Florida Department of Environmental Protection has adequately addressed the concerns detailed in our letter to you dated September 8, 2000; therefore, EPA has no further comments at this time.

Thank you again for the opportunity to comment on the UTC - Pratt & Whitney preliminary determination. If you have further questions or comments, please direct them to either Art Hofmeister at (404) 562-9115 or Jim Little at (404) 562-9118.

Sincerely,

R. Douglas Neeley, Chief  
Air and Radiation Technology Branch  
Air, Pesticides and Toxics  
Management Division

cc: G. King  
C. Holladay  
D. Guzman, PSC  
S. Baldeman, SED  
B. Busi, Balder  
NPS



## Linero, Alvaro

---

**From:** McCann, Bob [BMcCann@GOLDER.com]  
**Sent:** Wednesday, May 02, 2001 9:23 AM  
**To:** Reynolds, John; Linero, Alvaro  
**Cc:** Gee, Dean; Susi, Benny; Davis, Jeffrey M.; Alberghini, David; Cires, Miguel A.  
**Subject:** RE: Pratt RD180 permit conditions- Plots of Predicted CO Concentrations

PRATTplots1.xls

John

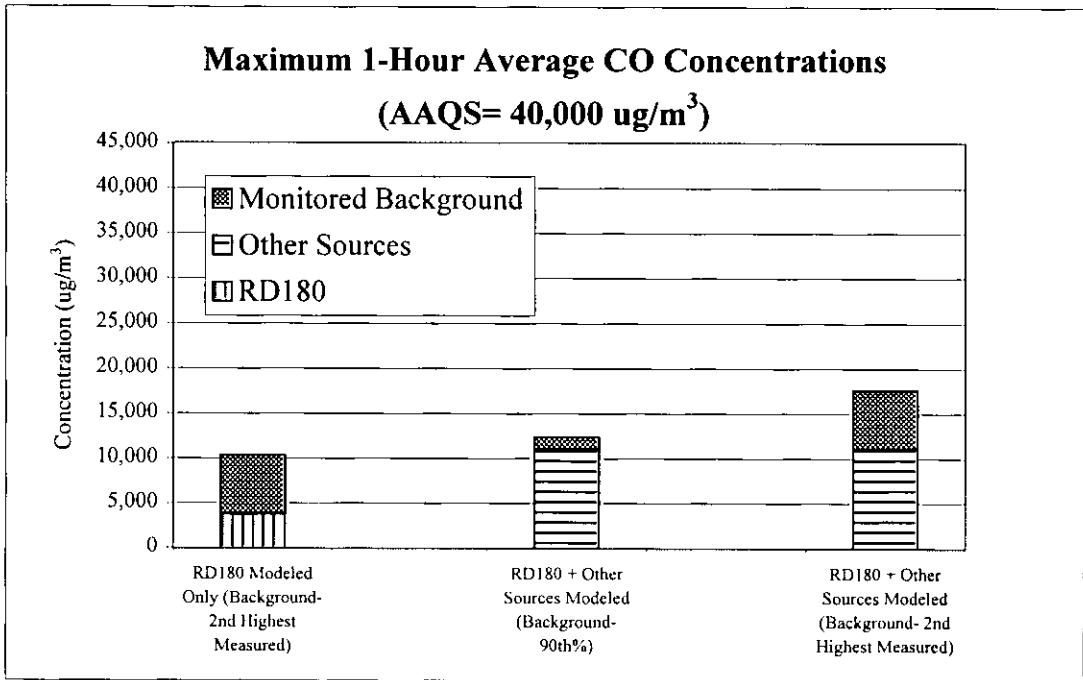
Attached is file with plots of maximum CO concentrations predicted for the project.

Three scenarios are presented.

1. Maximum CO impacts due to project alone added to non-modeled background concentration that was based on second-highest conc. measured in Palm Beach County. These results were presented in original application.
2. Maximum CO impacts due to project added to modeled background concentration due to other emission sources and due to non-modeled background concentration derived from measured concentration using the 90th percentile. These results were presented in followup correspondence.
3. Maximum CO impacts due to project added to modeled background concentration due to other emission sources and due to non-modeled background concentration derived from measured concentration using second-highest concentration (same as scenario 1).

I have also faxed the plots to you.

Bob McCann  
Golder Associates Inc.  
6241 NW 23rd Street  
Gainesville, FL 32653  
Tel: (352) 336-5600 x 546  
Fax: (352) 336-6603  
E-mail: bob\_mccann@golder.com



1-hour Concentrations (ug/m3)

	Modeled Sources		Monitored Background	Total	AAQS
	RD180	Other Sources	Highest, Second Highest		
RD180 Modeled Only (Background- 2nd Highest Measured)	3,822	0	6,440	10,262	40,000
RD180 + Other Sources Modeled (Background- 90th%)	0	11,009	1,300	12,309	40,000
RD180 + Other Sources Modeled (Background- 2nd Highest Measured)	0	11,099	6,440	17,539	40,000