

Air Permit Review

Permit Issue Date: **December 24, 2007**

Region: Raleigh Regional Office
County: Durham
NC Facility ID: 3200041
Inspector's Name: Brian Bland
Date of Last Inspection: 04/25/2007
Compliance Code: 3/In Compliance – Insp.

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|--|---|--|---|--|
| Facility Data | | | Permit Applicability | |
| Applicant: GE Aviation – Durham Engine Facility 3701 S. Miami Blvd. Research Triangle Park, NC 27709 SIC: 3724/Aircraft Engines & Engine Part NAICS: 336412/Aircraft Engine and Engine Parts Manufacturing Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V | | | SIP: 2D .0516 and .0521 NSPS: Not Applicable NESHAP: Not Applicable PSD: Not Applicable PSD Avoidance: 2Q .0317 to avoid 2D .0530 NC Toxics: Not Applicable 112(r): Not Applicable Other: Not Applicable | |
| Contact Data | | | Application Data | |
| Facility Contact | Authorized Contact | Technical Contact | Application Number: 3200041.07A Date Received: 04/19/2007 Application Type: Renewal Application Schedule: TV-Renewal Existing Permit Data Existing Permit Number: 07354/T08 Existing Permit Issue Date: 03/03/2003 Existing Permit Expiration Date: 02/28/2008 | |
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| Review Engineer: David Putney Review Engineer's Signature: _____ Date: _____ | | | Comments / Recommendations: | |
| | | | Issue 07354/T09 Permit Issue Date: December 24, 2007 Permit Expiration Date: November 30, 2012 | |

I Reason for Application:

The GE Aircraft Engines – Durham Engine Facility located in Research Triangle Park, Durham County, North Carolina currently operates under Title V Permit No. 07354T08 with an expiration date of 2/28/08. The Permittee submitted application No. 3200041.07A to renew their Title V permit under 15A NCAC 2Q .0513. Note that section AA3 of application 3200041.07A requests a name change from GE Aircraft Engines – Durham Engine Facility to GE Aviation – Durham Engine Facility. Note that this is a name change only and does not include an ownership change.

GE Aviation develops, manufactures and tests turbine engines for commercial aircraft at the Durham Engine Facility. According to application No. 3200041.07A this renewal does not involve the addition, deletion or modification of any equipment at this facility.

II County Attainment Status:

Durham County is currently designated as a maintenance area for CO and non-attainment for ozone. NC DAQ has initiated the procedures to re-designate the Triangle area (including Durham County) as attaining the 8-hour ozone standard, however this county is currently designated non-attainment for ozone.

III Permit Shield:

The Permittee submitted application No. 3200041.07A to renew their Title V permit under 15A NCAC 2Q .0513. This modification was received by DAQ on 4/19/07 which is more than 9 months prior to expiration of Permit No. 07354T08. Therefore, the Permittee is covered by the application shield described in 2Q .0512(b)(1) and 2Q .0513(c).

IV Equipment List:

The following table summarizes the current emission sources and associated air pollution control devices located at this facility (as listed in Permit No. 07354T08):

| Emission Source ID No. | Emission Source Description | Control Device ID No. | Control Device Description |
|--|---|-----------------------|--|
| ES-1 NSPS Kb | One fixed-roof, horizontal, aviation fuel storage tank (51,000 gallons capacity) | C-1 | One carbon absorption canister (3.67 feet x 4.33 feet x 6.25 feet) |
| ES-2 NSPS Kb | One fixed-roof, horizontal, aviation fuel storage tank (51,000 gallons capacity) | C-2 | One carbon absorption canister (3.67 feet x 4.33 feet x 6.25 feet) |
| ES-3 | One turbine engine test cell | N/A | N/A |
| ES-4, ES-5, ES-6, ES-7, ES-8, ES-9 and ES-10 | Seven diesel-fired emergency use internal combustion engines (643 hp, 643 hp, 587 hp, 72.8 hp, 72.8 hp, 175 hp and 175 hp capacities) | N/A | N/A |

Note that, according to the Permittee, sources ES-1, ES-2 and ES-3 have not been installed at this facility yet (refer to email from Mike Burns of GE Aviation, dated 5/7/07).

Since ES-1 and ES-2 have no applicable requirements (NSPS Kb no longer applies – refer to the discussion in section V.A.i. of this document, below) these sources are moved to the insignificant activities list of Permit No. 07354T09.

Sources ES-4 through ES-8 are emergency generators whereas sources ES-9 and ES-10 are fire pumps (refer to the inspection report dated 5/2/07).

V Regulatory Review:

A. Two fixed-roof, horizontal, aviation fuel storage tanks (51,000 gallons capacity, each) ID Nos. ES-1 and ES-2:

i. 2D .0524 “New Source Performance Standards”

Permit No. 07354T08 applies this rule to the two fixed-roof, horizontal, aviation fuel storage tanks (ID Nos. ES-1 and ES-2) due to the applicability of 40 CFR Part 60, Subpart Kb “Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984.” However, EPA amended this rule on 10/15/03 such that it no longer applies to tanks with capacity greater than or equal to 151 m³ (i.e. 39,893 gallons) storing liquids with maximum true vapor pressure less than 3.5 kPa (i.e. 26.3 mmHg) [refer to 40 CFR 60.11b(b)].

According to the MSDS supplied by the Permittee, the aviation fuel that will be stored in these tanks upon construction has a vapor pressure of 2 mmHg at 68 °F. According to the NC State Climate Office the normal monthly maximum temperature for the subject facility is approximately 88.6 °F (in July). The maximum true vapor pressure for the stored VOLs is predicted to be 3.64 mmHg. Therefore Subpart Kb will not apply to tanks ES-1 and ES-2 and that rule is not included in Permit No. 07354T09.

ii. 2D .0925 “Petroleum Liquid Storage in Fixed Roof Tanks”

This rule applies to all fixed roof storage vessels with capacities greater than 39,000 gallons that contain volatile petroleum liquids with true vapor pressures greater than 1.52

psia (i.e. 78.6 mmHg). Since the aviation fuel that will be stored in tanks ES-1 and ES-2 has a vapor pressure < 78.6 mmHg (see discussion of 2D .0524), this rule will not apply.

iii. 2D .0949 “Storage of Miscellaneous Volatile Organic Compounds”

This rule applies certain requirements to stationary tanks, reservoirs, or containers with capacity > 50,000 gallons that (1) are used to store liquid VOCs with vapor pressure \geq 1.5 psia (i.e. 77.6 mmHg), and (2) are not subject to 2D .0925 or 2D .0933. Since the aviation fuel that will be stored in tanks ES-1 and ES-2 has a vapor pressure of < 77.6 mmHg (see discussion of 2D .0524), this rule will not apply.

B. One turbine engine test cell ES-3:

i. 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

This rule will apply to the turbine engine test cell when installed and limits the SO₂ emissions from this device to 2.3 (lb/10⁶ Btu). The current AP-42 document does not include emission factors for turbine engines, however, it does have emission factors for natural gas-fired and distillate fuel oil-fired combustion turbines which is considered a reasonable surrogate. Table 3.1-2a of the current AP-42 provides an emission factor of 0.033 (lb SO₂/10⁶ Btu) for distillate oil combustion in an uncontrolled combustion turbine. Compliance with this rule is indicated, without controls.

Permit No. 02646T09 will include the standard shell language for the emission limits and testing for 2D .0516 but (since the fuels used are inherently compliant) will not require any additional testing or monitoring, recordkeeping or reporting (MRR) requirements to demonstrate compliance for the turbine engine test cell.

ii. 2D .0521 “Control of Visible Emissions”

This rule requires that the Permittee “prevent, abate and control emissions generated from fuel burning operations and industrial processes where an emission can reasonably be expected to occur...” This rule may or may not apply to the turbine engine test cell when installed. If this rule applies, this source would be subject to 2D .0521(b). However, paragraph 2D .0521(b) includes the statement “[t]his rule does not apply to engine maintenance, rebuild, and testing activities where controls are infeasible ...”. Therefore, 2D .0521(b) may or may not apply to this source when installed, depending upon whether or not DAQ determines controls to be feasible.

Permit No. 07354T08 does not apply this rule to the turbine engine test cell. Permit No. 07354T09 will not apply this rule to the turbine engine test cell either since (1) it may not apply to that source upon installation, and (2) if it does apply, this source is considered very unlikely to violate the opacity limits in 2D .0521(b).

iii. 2Q .0317 “Avoidance Conditions”

The turbine engine test cell (ID No. ES-3) is subject to the PSD avoidance condition in Permit No. 07354T09 (refer to the discussion in section V.D.ii. of this document, below).

C. Seven emergency use internal combustion engines as follows:

- Diesel-fired emergency generator (643 hp maximum power output rating, ID No. ES-4);**
- Diesel-fired emergency generator (643 hp maximum power output rating, ID No. ES-5);**
- Diesel-fired emergency generator (587 hp maximum power output rating, ID No. ES-6);**
- Diesel-fired emergency generator (72.8 hp maximum power output rating, ID No. ES-7);**
- Diesel-fired emergency generator (72.8 hp maximum power output rating, ID No. ES-8);**
- Diesel-fired emergency fire pump (175 hp maximum power output rating, ID No. ES-9); and**
- Diesel-fired emergency fire pump (175 hp maximum power output rating, ID No. ES-10);**

According to the current DAQ emission estimation spreadsheets for internal combustion engines, each of these engines meets the qualifications set forth at 15A NCAC 2Q .0503(8) to be considered an insignificant activity because of size or production rate. However, the Permittee has decided to keep these devices on their air quality permit.

i. 2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

This rule applies to the seven diesel-fired emergency use internal combustion engines and limits the SO₂ emissions from these devices to 2.3 (lb/10⁶ Btu).

Table 3.3-1 of the 5th edition of the AP-42 document predicts SO_x emissions from diesel fuel combustion in small industrial engines (i.e. < 600 hp) of 0.29 (lb/million Btu).

Compliance with this rule is anticipated, without controls.

Permit No. 07354T09 will include the standard shell language for the emission limits and testing for 2D .0516 but (since diesel fuel is an inherently compliant fuel) will not require any additional testing or MRR requirements to demonstrate compliance for these seven diesel-fired emergency use internal combustion engines.

ii. 2D .0521 “Control of Visible Emissions”

This rule requires that the Permittee “prevent, abate and control emissions generated from fuel burning operations and industrial processes where an emission can reasonably be expected to occur...” This rule applies to the emergency generators and fire pumps at this facility. Except for those VEs resulting from uncombined water or occurring during startup, shutdown and malfunctions that are regulated under 2D .0535, paragraph (d) of this rule requires that 6-minute average VEs from these sources be less than or equal to 20% opacity with the following exceptions:

- One six-minute average VE per hour may exceed 20% opacity as long as it does not also exceed 87% opacity; and
- Up to four six-minute average VEs per 24-hour period may exceed 20% opacity as long as they do not also exceed 87% opacity.

Current Permit No. 07354T08 does not include any MRR requirements associated with 2D .0521 for these sources since they were considered extremely unlikely to violate the rule as permitted. No MRR requirements associated with 2D .0521 will be included in Permit No. 07354T09 for these sources for the same reason.

iii. 2Q .0317 “Avoidance Conditions”

These seven diesel-fired emergency use internal combustion engines are subject to the PSD avoidance condition in Permit No. 07354T09 (refer to the discussion in section V.D.ii. of this document, below).

D. Multiple Emission Source(s) Specific Limitations and Conditions:

i. 2D .1806 “Control and Prohibition of Odorous Emissions”

This rule requires the Permittee to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility’s boundary. Paragraph 2D .1806(c) states, in part, “...this Rule shall apply to all operations that may produce odorous emissions that can cause or contribute to objectionable odors beyond the facility’s boundaries.” The permit writer does not believe that any sources at this facility will produce an objectionable odor, as defined at 2D .1801(9). Therefore, this rule will not be included in Permit No. 07354T09 (as it was not in Permit No. 07354T08).

ii. 2Q .0317 “Avoidance Conditions”

This facility has the potential to emit > 250 tons per year, each, of NO_x and CO but has avoided classification as a major source for purposes of PSD via the acceptance of an avoidance condition that limits facility-wide emissions of each of those two pollutants to < 250 tons per consecutive 12-month period. The sources of these pollutants include the turbine engine test cell (ID No. ES-3), the seven emergency use internal combustion engines (ID Nos. ES-4 through ES-10) and the numerous small natural gas-fired combustion sources at this facility that are included on the list of insignificant activities.

For the purposes of the PSD avoidance condition, all the natural gas-fired combustion devices are considered one emission unit. For these sources the Permittee is required to monitor the facility-wide natural gas usage from the utility bills and calculate emissions using the appropriate emission factors from AP-42.

For the diesel-fired emergency engines the Permittee is required to monitor the hours of operation of each device. The Permittee is required to calculate the emissions from these sources using information from the hour meters, fuel flow specifications from the equipment manufacturers, and the appropriate emission factors from AP-42.

The turbine engine test cell has not been constructed at this facility yet – therefore the PSD avoidance condition does not currently require any monitoring, recordkeeping or reporting for this device. However, the PSD avoidance condition does stipulate that, upon the construction of the turbine engine test cell, the Permittee will be required to monitor the number of turbine engines tested and the testing time. The Permittee will be required to calculate emissions based on that testing data and an emissions calculation system, approved by the Director of DAQ, which correlates fuel flow to the appropriate engine family specific emission profile.

The Permittee is required to submit semiannual reports of the monitoring data described above and the emissions calculations for each consecutive 12-month period ending within the reporting period.

VI NSPS/NESHAP/Toxics/CAM/112(r)/PSD Applicability:

NSPS: The NSPS that could possibly apply to this facility include 40 CFR Part 60, Subpart Kb and Subpart IIII.

Subpart Kb “Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984” does not apply because the storage tanks at this facility store liquids with maximum true vapor pressures of less than 3.5 kPa [i.e. they are exempted at §60.110b(b) – see the discussion in Section V.A.i. of this document].

Subpart IIII “Stationary Compression Ignition Internal Combustion Engines” (CI ICE) does not apply at this time. Subpart IIII applies to owner/operators of CI ICE that

- Were modified or reconstructed after 7/11/05; or
- Whose construction was commenced
 - (1) As a certified NFPA fire pump engine after 7/1/06; or
 - (2) As any other CI ICE after 4/1/06.

The emergency generators at this facility pre-date this regulation and have not been modified or reconstructed since 7/11/05.

NESHAP: The NESHAP that could apply to this facility include: 40 CFR Part 63, Subpart GG “Aerospace Manufacturing and Rework Facilities”, Subpart ZZZZ “Reciprocating Internal Combustion Engines” and Subpart P P P P P “Engine Test Cells/Standards”.

None of these MACT standards apply to the subject facility because this facility is not classified as a major source of HAPs. Each of these MACT standards apply only to major sources of HAPs [refer to §63.741(a), §63.6585 §63.9285].

Toxics: The Permittee has not yet triggered the NC toxics program. The combustion sources at this facility are currently exempt from the NC toxics program by 2Q .0702(a)(18) and the Director has not yet required a toxics demonstration under 2Q .0705(c).

CAM: This facility does not meet the applicability criteria of §64.2 since it does not use a control device to comply with an emission limit for a pollutant from an emission unit at the facility that has the potential to emit that pollutant at rates higher than the Title V major source threshold.

112(r): According to Form A3 of application 3200041.07A this facility does not use, handle, or store any regulated materials onsite in quantities in excess of the associated thresholds and is therefore not subject to the requirements of this regulation other than general duty.

PSD/New Source Review:

This facility has the potential to emit > 250 tons per year, each, of NO_x and CO but has avoided classification as a major source for purposes of PSD via the acceptance of an avoidance condition that limits facility-wide emissions of each of those pollutants to < 250 tons per consecutive 12-month period.

Application 3200041.07A (i.e. this permit renewal) does not involve a modification. According to the most recent update of the county minor baseline dates for PSD increment tracking (as posted on the DAQ website – list updated on 4/6/04), Durham County has not triggered minor source increment tracking. Therefore, neither PSD review nor increment tracking is triggered at this time.

VII Permit Modifications/Changes:

The following table briefly summarizes the changes in Permit No. 07354T09 resulting from Permit Application No. 3200041.07A:

| Old Page(s) | New Page(s) | Condition/Item | Description of Change(s) |
|---------------|-------------|------------------|---|
| Part I | | | |
| Global | Global | N/A | <ul style="list-style-type: none"> Change permit revision number to T09 Change the issuance/effective dates of the permit |
| 3 | 3 | Equipment List | Remove tanks ES-1 and ES-2 and the associated controls (these are changed to insignificant activities) |
| 4 | 4 | 2.1 A (07354T08) | Modify section to address the turbine engine test cell (ID No. ES-3) instead of sources ES-1 and ES-2 |
| 5-6 | 4 - 5 | 2.1 B | Modify section to address the 7 emergency use internal combustion engines only (i.e. not ES-3) |
| 5 - 6 | 6 - 7 | 2.1 B (07354T08) | Modify the PSD avoidance condition to reference rule 2Q .0317 instead of rule 2D .0530, clarify the monitoring/recordkeeping/reporting requirements, and move it to section 2.2 of the permit |
| N/A | 6 - 7 | 2.2 A | Add section 2.2 A to address 2Q .0317 (i.e. the PSD avoidance condition for NO _x and CO |
| 7 - 14 | 8 - 15 | Section 3 | Update General Conditions to the current shell |

Note: “Condition/Item” in the table above refers to the permit condition and item number as it appears in Permit No. 07354T09 except where otherwise noted.

VIII Title V Permit History:

The following table provides a brief summary of Title V permit revisions for this facility:

| Permit No. | Issuance Date | Description of Revision |
|------------|---------------|---|
| 07354T08 | 03/03/03 | Issue initial Title V permit (effective date of 04/17/03) |
| 07354T09 | 12/24/07 | Renew the Title V permit |

IX Application Fee:

The Permittee did not submit a fee with application 3200041.07A. According to 2Q .0203(i) no fee is required for a name change (that does not also include an ownership change) and/or a permit renewal.

X Zoning Consistency:

A zoning consistency determination was not submitted with application 3200041.07A. According to 2Q .0507(d)(1), since this modification does not involve either a new facility or the physical expansion of an existing facility a zoning consistency determination is not required.

XI Compliance Status:

Mr. Brian Bland of the RRO indicated that the facility appeared to be operating in compliance with air quality standards and regulations during the most recent inspection of this facility (conducted on 04/25/07 - refer to the associated inspection report dated 05/02/07).

XII Draft Permit Review:

A draft version of Permit No. 07354T09 was sent to the Permittee and the RRO for a review and comment period on 10/12/07. The RRO staff had no comments other than to recommend issuance of the renewed permit. The Permittee requested that the source referred to as “jet engine test cell” in Permit No. 07354T08 be instead referred to as “turbine engine test cell” since they may occasionally test turbine engines not destined for use in aircraft.

XIII Application 3200041.07A Chronology:

04/19/07: DAQ received application 1400041.05A.

10/12/07: RCO sends draft version of Permit No. 07354T09 to RRO and the Permittee.

11/14/07: RCO sends proposed Permit No. 07354T09 out for public comment and to EPA Region 4 staff for concurrent review.

12/14/07: No public comments received - therefore no public hearing scheduled by NC DAQ.

12/24/07: After receiving notification that EPA Region 4 staff had no comments (see email dated XX/XX/07), NC DAQ issued Permit No. 07354T09.

XIV Recommendation:

The Title V Permit renewal application for the GE Aviation – Durham Engine Facility in Research Triangle Park, Durham County, North Carolina has been reviewed by NC DAQ personnel to determine compliance with all applicable procedures and requirements. NC DAQ personnel have determined that this facility is complying or will achieve compliance with all applicable requirements as specified in Permit No. 07354T09.

Issuance of Permit No. 07354T09 is recommended.