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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. NM272; Special Conditions No. 25-256-SC]

#### **Special Conditions: Airbus Model A300 B4-600, -B4-600R, -F4-600R Series Airplanes; and Model A310-200 and -300 Series Airplanes; High-Intensity Radiated Fields (HIRF)**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for Airbus model A300 B4-600, -B4-600R, and -F4-600R (collectively called A300-600) series airplanes; and A310-200 and -300 series airplanes modified by Canard Aerospace Corporation. These modified airplanes will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. The modification incorporates the installation of Honeywell Air Data Inertial Reference Units (ADIRU) that perform critical functions. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for the protection of these systems from the effects of high-intensity radiated fields (HIRF). These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** The effective date of these special conditions is December 29, 2003. Comments must be received on or before February 5, 2004.

**ADDRESSES:** Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM-113), Docket No. NM272, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; or delivered in duplicate to the Transport Airplane Directorate at the above address. All comments must be marked: Docket No. NM272.

**FOR FURTHER INFORMATION CONTACT:** Greg Dunn, FAA, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2799; facsimile (425) 227-1320.

#### **SUPPLEMENTARY INFORMATION:**

##### **Comments Invited**

The FAA has determined that notice and opportunity for prior public comment is impracticable because these procedures would significantly delay certification of the airplane and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance; however, the FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning these special conditions. The docket is available for public inspection before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of this preamble between 7:30 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

We will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

If you want the FAA to acknowledge receipt of your comments on these special conditions, include with your comments a pre-addressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it back to you.

##### **Background**

On November 14, 2003, Canard Aerospace Corporation, 13050 Pioneer Trail, Eden Prairie, Minnesota 55347, applied for a Supplemental Type Certificate (STC) to modify Airbus model A300-600 series; and A310-200, -300 series airplanes approved under

Type Certificate No. A35EU. The Airbus A300 and A310 series airplanes are a large transport category airplane. The wide body twin-engine, twin-aisle aircraft family offers configurations for 220 to 360 seats or freighter versions. These airplanes have maximum take-off weights of up to 378,530 pounds and are powered by either General Electric CF6-80C2 or Pratt & Whitney JT9D/PW4000 turbofan engines. The modification incorporates the installation of the Honeywell Air Data Inertial Reference Units (ADIRU) to replace aging Inertial Reference Units (IRU). The ADIRU provide flight critical functions by determining the airplane's attitude, heading, and position. The avionics/electronics and electrical systems installed in this airplane have the potential to be vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

##### **Type Certification Basis**

Under the provisions of 14 CFR 21.101, Canard Aerospace must show the Airbus A300 and A310 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A35EU, or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The certification basis for the Airbus A300-600 series airplanes includes 14 CFR part 25, dated February 1, 1965, as amended by Amendments 25-1 through 25-74; 14 CFR part 36 effective December 1, 1969, including Amendments 36-1 through 36-22. The certification basis for the modified Airbus A310-200 and -300 series airplanes includes 14 CFR part 25, dated February 1, 1965, as amended by Amendments 25-1 through 25-54; 14 CFR part 36 effective December 1, 1969, including Amendments 36-1 through 36-12. In addition to the basis cited for all of the above models, the certification basis includes special conditions, exceptions, and variations noted in Type Certificate Data Sheet (TCDS) A35EU.

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, part 25, as amended) do not contain adequate or appropriate safety standards for the Airbus model A300-600 series, and A310-200 and -300 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special

conditions, the Airbus model A300–600 series, and A310–200 and –300 series airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36.

Special conditions, as defined in 14 CFR 11.19, are issued in accordance with § 11.38 and become part of the type certification basis in accordance with § 21.101.

Special conditions are initially applicable to the model for which they are issued. Should Canard Aerospace apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A35EU to incorporate the same or similar novel or unusual design feature, these special conditions would also apply to the other model under the provisions of § 21.101.

#### Novel or Unusual Design Features

As noted earlier, the Airbus model A300–600 series, and A310–200 and –300 series airplanes modified by Canard Aerospace will incorporate new Honeywell Air Data Inertial Reference Units (ADIRU) that will perform critical functions. This system may be vulnerable to high-intensity radiated fields external to the airplane. The current airworthiness standards of part 25 do not contain adequate or appropriate safety standards for the protection of this equipment from the adverse effects of HIRF. Accordingly, this system is considered to be a novel or unusual design feature.

#### Discussion

There is no specific regulation that addresses protection requirements for electrical and electronic systems from HIRF. Increased power levels from ground-based radio transmitters and the growing use of sensitive avionics/electronics and electrical systems to command and control airplanes have made it necessary to provide adequate protection.

To ensure that a level of safety is achieved equivalent to that intended by the regulations incorporated by reference, special conditions are needed for the Airbus model A300 and A310 series airplanes modified by Canard Aerospace. These special conditions require that new avionics/electronics and electrical systems that perform critical functions be designed and installed to preclude component damage and interruption of function due to both the direct and indirect effects of HIRF.

#### High-Intensity Radiated Fields (HIRF)

With the trend toward increased power levels from ground-based transmitters, and the advent of space and satellite communications coupled with electronic command and control of the airplane, the immunity of critical avionics/electronics and electrical systems to HIRF must be established.

It is not possible to precisely define the HIRF to which the airplane will be exposed in service. There is also uncertainty concerning the effectiveness of airframe shielding for HIRF. Furthermore, coupling of electromagnetic energy to cockpit-installed equipment through the cockpit window apertures is undefined. Based on surveys and analysis of existing HIRF emitters, an adequate level of protection exists when compliance with the HIRF protection special condition is shown with either paragraph 1 or 2 below:

1. A minimum threat of 100 volts rms (root-mean-square) per meter electric field strength from 10 KHz to 18 GHz.

a. The threat must be applied to the system elements and their associated wiring harnesses without the benefit of airframe shielding.

b. Demonstration of this level of protection is established through system tests and analysis.

2. A threat external to the airframe of the field strengths identified in the table below for the frequency ranges indicated. Both peak and average field strength components from the table are to be demonstrated.

Frequency	Field Strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz .....	50	50
100kHz–500 kHz .....	50	50
500kHz–2 MHz .....	50	50
2 MHz–30 MHz .....	100	100
30 MHz–70 MHz .....	50	50
70 MHz–100 MHz .....	50	50
100 MHz–200 MHz .....	100	100
200 MHz–400 MHz .....	100	100
400 MHz–700 MHz .....	700	50
700 MHz–1 GHz .....	700	100
1 GHz–2 GHz .....	2000	200
2 GHz–4 GHz .....	3000	200
4 GHz–6 GHz .....	3000	200
6 GHz–8 GHz .....	1000	200
8 GHz–12 GHz .....	3000	300
12 GHz–18 GHz .....	2000	200
18 GHz–40 GHz .....	600	200

\*The field strengths are expressed in terms of peak of the root-mean-square (rms) over the complete modulation period.

The threat levels identified above are the result of an FAA review of existing studies on the subject of HIRF, in light of the ongoing work of the

Electromagnetic Effects Harmonization Working Group of the Aviation Rulemaking Advisory Committee.

#### Applicability

As discussed above, these special conditions are applicable to Airbus model A300–600 series, and A310–200 and –300 series airplanes modified by Canard Aerospace Corporation. Should Canard Aerospace apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A35EU to incorporate the same or similar novel or unusual design feature, these special conditions would apply to that model as well under the provisions of § 21.101.

#### Conclusion

This action affects only certain novel or unusual design features on Airbus model A300–600 series, and A310–200 and –300 series airplanes modified by Canard Aerospace. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment procedure in several prior instances and has been derived without substantive change from those previously issued. Because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

#### List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

#### The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the supplemental type certification basis for the Airbus model A300–600 series, A310–200 series, and A310–300 series airplanes modified by Canard Aerospace Corporation.

1. *Protection from Unwanted Effects of High-Intensity Radiated Fields*

(HIRF). Each electrical and electronic system that performs critical functions must be designed and installed to ensure that the operation and operational capability of these systems to perform critical functions are not adversely affected when the airplane is exposed to high-intensity radiated fields.

2. For the purpose of these special conditions, the following definition applies: *Critical Functions*: Functions whose failure would contribute to or cause a failure condition that would prevent the continued safe flight and landing of the airplane.

Issued in Renton, Washington, on December 30, 2003.

**Mike Kaszycki,**

*Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. 2003-NE-01-AD; Amendment 39-13422; AD 2004-01-08]

RIN 2120-AA64

#### Airworthiness Directives; Pratt & Whitney JT9D-7R4 Series Turbofan Engines

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD) that applies to Pratt & Whitney (PW) JT9D-7R4 series turbofan engines. This amendment requires on JT9D-7R4 series turbofan engines with steel fan cases, replacement of the existing one-piece fan case shield with a thicker four-piece fan case shield and would add four fan case shield supports. This amendment results from two uncontained full fan blade fracture events that resulted in penetration of the steel fan case and fan case shield. We are issuing this AD to prevent uncontained fan blade failures, resulting in damage to the airplane.

**DATES:** Effective February 10, 2004.

**ADDRESSES:** The service information referenced in this AD may be obtained from Pratt & Whitney, 400 Main St., East Hartford, CT 06108; telephone (860) 565-7750; fax (860) 565-1605. This information may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel,

12 New England Executive Park, Burlington, MA.

#### FOR FURTHER INFORMATION CONTACT:

Keith Lardie, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7189; fax (781) 238-7199.

#### SUPPLEMENTARY INFORMATION:

A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that applies to PW JT9D-7R4 series turbofan engines was published in the **Federal Register** on April 23, 2003 (68 FR 19962). That action proposed to require on JT9D-7R4 series turbofan engines with steel fan cases, replacement of the existing one-piece fan case shield with a thicker four-piece fan case shield and would add four fan case shield supports.

#### Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

#### Request To Update Material Cost

Two commenters state that the material cost in the economic analysis published with the proposed AD is incorrect. They note that since the notice of proposed rulemaking (NPRM) was issued, a subsequent service bulletin (SB) revision was issued that quoted a higher price for the containment shield kit. The revised SB also included a reduction in the number of work hours to do the replacements.

The FAA agrees. We have revised the economic analysis in this AD.

#### Request To Update Service Bulletin Revision and Date

One commenter, the manufacturer, recommends that the four-piece fan cases, part numbers (P/Ns) 815132 and 821545, be installed using the information found in PW SB JT9D-7R4-72-583, Revision 1, and PW SB JT9D-7R4-72-584, Revision 1, both dated September 10, 2003, instead of the original release of each SB, dated December 12, 2002. The manufacturer states that the SB revisions require changing the position of the shield attachment hardware and the assembly sequence to provide a better fit between the washer and the containment shield bolthole.

The FAA agrees that these SB revisions enhance the installation process. Removal of the old containment shield, and proper installation of the new containment shield is the purpose of this AD. Since

we are referencing the SBs for additional information only and are not incorporating those documents by reference, we have removed the date from the references in paragraphs (a), (b), and (c) in the AD. Removing the dates will allow the operator to refer to the latest revisions of the SBs.

#### Request To Comply at Next Heavy Maintenance vs. Repair

One commenter believes the intent of this AD is to incorporate the new fan case shield assembly at the next heavy maintenance, which would involve separation of the "B" flange. During a less invasive visit (repair), the containment shields are not normally accessed and would cause an incremental cost increase.

The FAA agrees. The purpose of this AD is to replace the containment shield the next time the fan case module is accessed, which would involve the separation of the "B" flange. The FAA has changed the compliance time to reference "shop visit" and added Paragraph (d) to provide a definition of "shop visit" that makes this intent clear. As a result, the remaining paragraphs are changed from (d) and (e) to (d), (e), (f), and (g).

#### Request for Clarification of Engine Overhaul vs. Shop Visit

The same commenter expresses a concern about the ambiguous definition of engine overhaul and suggests that a simplified clarification might further reduce compliance times. The commenter also requests further clarification that the intent is a shop visit for heavy maintenance or overhaul.

The FAA agrees. Since the AD intends to mandate the replacement of the containment shield during the next time the engine is serviced for an in-shop overhaul, and not during on-wing replacement, the compliance statement is revised by replacing "engine overhaul where access to the fan case aft containment area is available" with "shop visit". The definition of shop visit is added in a new paragraph (d) of the AD. As a result, the remaining paragraphs are changed from (d) and (e) to (d), (e), (f), and (g).

#### Request To Return to Pre-Compliance Build Standard To Utilize Spare Parts

The same commenter asks that the AD include a provision to allow the removal of the four-piece fan case shield for those engines on which the improved containment has already been installed. The commenter seeks this provision to use up inventoried spare parts, but acknowledges that the final compliance date of December 31, 2012 must be met.