

Rules and Regulations

Federal Register

Vol. 60, No. 216

Wednesday, November 8, 1995

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM-119, Special Conditions No. 25-ANM-109]

Special Conditions: Bombardier Inc., Canadair Challenger CL-600-2B16 (CL-604 Variant), High-Intensity Radiated Fields

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Canadair Challenger CL-600-2B16 (CL-604 Variant) airplane. This airplane will utilize new avionic/electronic systems that provide critical data to the flightcrew. The applicable regulations do not contain adequate or appropriate safety standards for the protection of these systems from the effects of high-intensity radiated fields. 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 October 31, 1995. Comments must be received on or before December 26, 1995.

ADDRESSES: Comments on these final special conditions, request for comments, may be mailed in duplicate to: Federal Aviation Administration, Office of the Assistant Chief Counsel, Attn: Rules Docket (ANM-7), Docket No. NM-119, 1601 Lind Avenue SW., Renton, Washington 98055-4056; or delivered in duplicate to the Office of the Assistant Chief Counsel at the above address. Comments must be marked: Docket No. NM-119, Comments may be inspected in the Rule Docket weekdays,

except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT:

Gregory L. Dunn, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055-4056, (206) 227-2799.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA has determined that good cause exists for making these special conditions effective upon issuance; however, interested persons are invited to submit such written data, views, or arguments as they may desire. Communications should identify the regulatory docket and special conditions number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. These special conditions may be changed in light of comments received. All comments submitted will be available in the Rules Docket for examination by interested persons, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this request must be submitted with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. NM-119." The postcard will be date stamped and returned to the commenter.

Background

On June 14, 1993, Bombardier Inc., Candor, P.O. Box 6087, Station Centreville, Montreal, Quebec H3C 3G9, applied to Transport Canada for a type design change to their Type Certificate A21EA in the transport airplane category for the Model CL-600-2B16 (CL-604 Variant) airplane. The CL-604 Variant is a low swept wing, business jet airplane powered by two GE CF 34-3B turbofan engines mounted on pylons extending from the aft fuselage. The airplane has a seating capacity of up to nineteen passengers, and a maximum ramp weight of 48,300 pounds.

Type Certification Basis

Under the provisions of § 21.101 of the FAR, Canadair must show, except as provided in § 25.2, that the Model CL-600-2B16 (CL-604 Variant) meets the applicable provisions of part 25, effective February 1, 1965, as amended by Amendments 25-1 through 25-78. In addition, the proposed certification basis for the Model CL-600-2B16 (CL-604 Variant) includes part 34, effective September 10, 1990, plus any amendments in effect at the time of certification; and part 36, effective December 1, 1969, as amended by Amendment 36-1 through the amendment in effect at the time of certification. No exemptions are anticipated. The special conditions incorporated herein form an additional part of the type certification basis. In addition, the certification basis may include other special conditions that are not relevant to these special conditions.

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 CL-600-2B16 (CL-604 Variant) because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16 to establish a level of safety equivalent to that established in the regulations.

Special conditions, as appropriate, are issued in accordance with § 11.49 of the FAR after public notice, as required by §§ 11.28 and 11.29, and become part of the type certification basis in accordance with § 21.101(b)(2).

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

Novel of Unusual Design Features

The Model CL-600-2B16 incorporates new avionic/electronic installations, including a digital Electronic Flight Instrument System (EFIS) and a limited Engine Indication and Crew Alerting System (EICAS). These systems may be

vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

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 electrical and electronic 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 issued for Canadair CL-600-2B16 (CL-604 Variant) which require that new technology electrical and electronic systems, such as the EFIS and EICAS, 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

With the trend toward increased power levels from ground based transmitters, plus the advent of space and satellite communications coupled with electronic command and control of the airplane, the immunity of critical digital avionics 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 per meter peak 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 following field strengths for the frequency ranges indicated.

| Frequency | Peak (V/M) | Average (V/M) |
|------------------------|------------|---------------|
| 10 KHz-100 KHz | 50 | 50 |
| 100 KHz-500 KHz | 60 | 60 |
| 500 KHz-2000 KHz | 70 | 70 |

| Frequency | Peak (V/M) | Average (V/M) |
|------------------------|------------|---------------|
| 2 MHz-30 MHz | 200 | 200 |
| 30 MHz-100 MHz | 30 | 30 |
| 100 MHz-200 MHz | 150 | 33 |
| 200 MHz-400 MHz | 70 | 70 |
| 400 MHz-700 MHz | 4,020 | 935 |
| 700 MHz-1000 MHz | 1,700 | 170 |
| 1 GHz-2 GHz | 5,000 | 990 |
| 2 GHz-4 GHz | 6,680 | 840 |
| 4 GHz-6 GHz | 6,850 | 310 |
| 6 GHz-8 GHz | 3,600 | 670 |
| 8 GHz-12 GHz | 3,500 | 1,270 |
| 12 GHz-18 GHz | 3,500 | 360 |
| 18 GHz-40 GHz | 2,100 | 750 |

As discussed above, these special conditions would be applicable initially to the Model CL-600-2B16 (CL-604 Variant). Should Canadair apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well, under the provisions of § 21.101(a)(1).

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the Federal Register. However, as the certification date for the Bombardier Inc., Canadair Challenger CL-600-2B16 (CL-604 Variant) is imminent, the FAA finds that good cause exists for making these special conditions effective upon issuance.

Conclusion

This action affects certain design features only on the Canadair CL-600-2B16 (CL-604 Variant) airplane. It is not a rule of general applicability and affects only the manufacturer who applied to the FAA for approval of these features on the airplane.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Federal Aviation Administration, Reporting and recordkeeping requirements.

The authority citation for these proposed special conditions is as follows:

Authority: 49 U.S.C. app. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et seq.; E.O. 11514; and 49 U.S.C. 106(g).

The Special Conditions

Accordingly, the following special conditions are issued as part of the type certification basis for the Bombardier Inc., Canadair Model CL-600-2B16 (CL-604 Variant) airplanes.

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 this 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 October 31, 1995.

Darrell M. Pederson,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100.

[FR Doc. 95-27705 Filed 11-7-95; 8:45 am]

BILLING CODE 4910-13-M

14 CFR Part 39

[Docket No. 95-ANE-32; Amendment 39-9420; AD 95-22-12]

Airworthiness Directives; Hamilton Standard 14RF, 247F, 14SF, and 6/5500/F Series Propellers

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD), applicable to Hamilton Standard 14RF, 247F, 14SF, and 6/5500/F (formerly Hamilton Standard/British Aerospace 6/5500/F) series propellers, that currently requires initial and repetitive inspections of the propeller control unit (PCU) servo ballscrew internal spline (BIS) teeth for wear, and replacement, if necessary, of PCU servo BIS assemblies. This amendment increases the repetitive PCU servo BIS teeth inspection interval from 1,500 to 2,500 hours time in service (TIS) for propellers that have a ballscrew quill damper installed. In addition, the FAA has reevaluated the optional installation of the Secondary Drive Quill (SDQ), and has added a new compliance end-date of June 30, 1998, for the installation of the SDQ. This AD will also require initial and repetitive torque check inspections of the primary ballscrew quill once the SDQ is installed. This amendment is prompted by field service and laboratory test data that indicate that the repetitive inspection interval can be safely increased, and by the development and availability of the SDQ. The actions specified by this AD are intended to prevent inability to control the propeller