

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Part 23**

[Docket No. CE243, Special Condition 23–183–SC]

Special Conditions; Dual Innovative Solutions & Support Electronic Flight Instrument Systems (EFIS) Installation in Pilatus PC–12, PC–12/45, and PC–12/47; Protection of Systems for High Intensity Radiated Fields (HIRF)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued to Innovative Solutions & Support (IS&S), 720 Pennsylvania Drive, Exton, PA 19341–1129, for a Supplemental Type Certificate for the Pilatus PC–12, PC–12/45, and PC–12/47 airplanes. These airplanes will have novel and unusual design features when compared to the state of technology envisaged in the applicable airworthiness standards. These novel and unusual design features include the installation of two 12" x 9" Integrated Flat Panel Display (IFPD) Electronic Flight Instrument Systems (EFIS), manufactured by IS&S, and components associated with this display system. The applicable regulations do not contain adequate or appropriate airworthiness 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 the airworthiness standards applicable to these airplanes.

DATES: The effective date of these special conditions is May 10, 2006. Comments must be received on or before June 19, 2006.

ADDRESSES: Comments may be mailed in duplicate to: Federal Aviation Administration, Regional Counsel, ACE–7, Attention: Rules Docket Clerk, Docket No. CE243, Room 506, 901 Locust, Kansas City, Missouri 64106. All comments must be marked: Docket No. CE243. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Wes Ryan, Aerospace Engineer, Standards Office (ACE–110), Small Airplane Directorate, Aircraft Certification Service, Federal Aviation

Administration, 901 Locust, Room 301, Kansas City, Missouri 64106; telephone (816) 329–4123.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because 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.

Comments Invited

Interested persons are invited to submit such written data, views, or arguments, as they may desire. Communications should identify the regulatory docket or notice 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. The special conditions may be changed in light of the comments received. All comments received 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. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. CE243." The postcard will be date stamped and returned to the commenter.

Background

In early February 2006, IS&S made an application to the FAA for a new Supplemental Type Certificate (STC) for the Pilatus PC–12, PC–12/45, and PC–12/47 airplanes, which are currently approved under TC No. A78EU. The proposed modification incorporates novel or unusual design features that are vulnerable to HIRF external to the airplane.

Type Certification Basis

Under the provisions of 14 CFR part 21, § 21.101, IS&S must show that the Pilatus PC–12, PC–12/45, and PC–12/47 aircraft meet the provisions of the original certification basis for each model, as listed on the Type Data Sheet A78EU, and the additional provisions & applicable regulations in effect on the date of application for this Supplemental Type Change. The additional systems related provisions

that cover the EFIS installation include: § 23.1301, § 23.1309, § 23.1311, § 23.1321, § 23.1322, § 23.1323, § 23.1331, § 23.1353, and § 23.1357 at the amendment level appropriate for the application date; exemptions, if any; and the special conditions adopted by this rulemaking action. Additional information regarding the certification basis for this STC is available from the applicant.

Discussion

If the Administrator finds that the applicable airworthiness standards do not contain adequate or appropriate safety standards because of novel or unusual design features of an airplane, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, as defined in § 11.19, are issued in accordance with § 11.38 after public notice 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 applicant apply for a supplemental type certificate to modify any other model already included on the same type certificate 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.

Novel or Unusual Design Features

IS&S plans to incorporate certain novel and unusual design features into an airplane for which the airworthiness standards do not contain adequate or appropriate safety standards for protection from the effects of HIRF. These features include dual EFIS systems and associated components, potentially susceptible to the HIRF environment that were not envisaged by the existing regulations for this type of airplane.

Protection of Systems From High Intensity Radiated Fields (HIRF)

Recent advances in technology have given rise to the application in aircraft designs of advanced electrical and electronic systems that perform functions required for continued safe flight and landing. Due to the use of sensitive solid-state advanced components in analog and digital electronics circuits, these advanced systems are readily responsive to the transient effects of induced electrical current and voltage caused by the HIRF. The HIRF can degrade electronic systems performance by damaging components or upsetting system functions.

Furthermore, the HIRF environment has undergone a transformation that was not foreseen when the current requirements were developed. Higher energy levels are radiated from transmitters that are used for radar, radio, and television. Also, the number of transmitters has increased significantly. There is also uncertainty concerning the effectiveness of airframe shielding for HIRF. Furthermore, coupling to cockpit-installed equipment through the cockpit window apertures is undefined.

The combined effect of the technological advances in airplane design and the changing environment has resulted in an increased level of

vulnerability of electrical and electronic systems required for the continued safe flight and landing of the airplane.

Effective measures against the effects of exposure to HIRF must be provided by the design and installation of these systems. The accepted maximum energy levels in which civilian airplane system installations must be capable of operating safely are based on surveys and analysis of existing radio frequency emitters. These special conditions require that the airplane be evaluated under these energy levels for the protection of the electronic system and its associated wiring harness. These external threat levels, which are lower than previous required values, are

believed to represent the worst case to which an airplane would be exposed in the operating environment.

These special conditions require qualification of systems that perform critical functions, as installed in aircraft, to the defined HIRF environment in paragraph 1 or, as an option to a fixed value using laboratory tests, in paragraph 2, as follows:

(1) The applicant may demonstrate that the operation and operational capability of the installed electrical and electronic systems that perform critical functions are not adversely affected when the aircraft is exposed to the HIRF environment defined below:

Frequency	Field strength (volts per meter)	
	Peak	Average
10 kHz–100 kHz	50	50
100 kHz–500 kHz	50	50
500 kHz–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 root-mean-square (rms) values.

or,

(2) The applicant may demonstrate by a system test and analysis that the electrical and electronic systems that perform critical functions can withstand a minimum threat of 100 volts per meter, electrical field strength, from 10 kHz to 18 GHz. When using this test to show compliance with the HIRF requirements, no credit is given for signal attenuation due to installation.

A preliminary hazard analysis must be performed by the applicant, for approval by the FAA, to identify either electrical or electronic systems that perform critical functions. The term “critical” refers to functions, whose failure would contribute to, or cause, a failure condition that would prevent the continued safe flight and landing of the airplane. The systems identified by the hazard analysis that perform critical functions are candidates for the application of HIRF requirements. A system may perform both critical and non-critical functions. Primary

electronic flight display systems, and their associated components, perform critical functions such as attitude, altitude, and airspeed indication. The HIRF requirements apply only to critical functions.

Compliance with HIRF requirements may be demonstrated by tests, analysis, models, similarity with existing systems, or any combination of these. Service experience alone is not acceptable since normal flight operations may not include an exposure to the HIRF environment. Reliance on a system with similar design features for redundancy as a means of protection against the effects of external HIRF is generally insufficient since all elements of a redundant system are likely to be exposed to the fields concurrently.

Applicability

As discussed above, these special conditions are applicable to the Pilatus PC-12, PC-12/45, and PC-12/47 airplanes. Should IS&S apply at a later date for a supplemental type certificate

to modify any other model on the same type certificate to incorporate the same novel or unusual design feature, the 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 one model of airplane. 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 period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. For this reason, and 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 23

Aircraft, Aviation safety, Signs and symbols.

Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.101; and 14 CFR 11.38 and 11.19.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the Pilatus PC-12, PC-12/45, and PC-12/47 airplanes modified by IS&S to add dual EFIS installations.

1. *Protection of Electrical and Electronic Systems From High Intensity Radiated Fields (HIRF)*. Each system that performs critical functions must be designed and installed to ensure that the operations, and operational capabilities of these systems to perform critical functions, are not adversely affected when the airplane is exposed to high intensity radiated electromagnetic fields external to the airplane.

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 Kansas City, Missouri on May 10, 2006.

David R. Showers,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 06-4624 Filed 5-17-06; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2005-21028; Directorate Identifier 2004-NM-238-AD; Amendment 39-14601; AD 2006-10-17]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 737-600, -700, -700C, -800, and -900 Series Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Boeing Model 737-600, -700, -700C, -800, and -900 series airplanes. This AD requires replacing brackets that hold the P5 panel to the airplane structure, the standby compass bracket assembly, the generator drive and standby power module, and the air conditioning module. This AD also requires, among other actions, inspecting for wire length and for damage of the connectors and the wire bundles, and doing applicable corrective actions if necessary. This AD results from an electrical burning smell in the flight compartment. We are issuing this AD to prevent wire bundles from contacting the overhead dripshield panel and modules in the P5 overhead panel, which could result in electrical arcing and shorting of the electrical connector and consequent loss of several critical systems essential for safe flight.

DATES: This AD becomes effective June 22, 2006.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the AD as of June 22, 2006.

ADDRESSES: You may examine the AD docket on the Internet at <http://dms.dot.gov> or in person at the Docket Management Facility, U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL-401, Washington, DC.

Contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207, for service information identified in this AD.

FOR FURTHER INFORMATION CONTACT: Binh Tran, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 917-6485; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION:

Examining the Docket

You may examine the airworthiness directive (AD) docket on the Internet at <http://dms.dot.gov> or in person at the Docket Management Facility office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Management Facility office (telephone (800) 647-5227) is located on the plaza level of the Nassif Building at the street address stated in the **ADDRESSES** section.

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to certain Boeing Model 737-600, -700, -700C, -800, and -900 series airplanes. That NPRM was published in the **Federal Register** on April 27, 2005 (70 FR 21689). That NPRM proposed to require replacing brackets that hold the P5 panel to the airplane structure, the standby compass bracket assembly, the generator drive and standby power module, and the air conditioning module. That NPRM also proposed to require, among other actions, inspecting for wire length and for damage of the connectors and the wire bundles, and doing applicable corrective actions if necessary.

New Relevant Service Information

Since the issuance of the NPRM, we have reviewed Revision 2 of Boeing Service Bulletin 737-24A1141, dated December 1, 2005 (Revision 1 of the service bulletin was referenced in the NPRM as the appropriate source of service information for doing certain proposed actions). Revision 2 updates multiple figures to correct typographical errors in the graphics or in the task or flag note tables. Revision 2 also moves a certain group of airplanes from one figure to another. The procedures in Revision 2 are essentially identical to those in Revision 1. No more work is necessary on airplanes changed as shown in Revision 1 of the service bulletin. Therefore, we have revised paragraph (f) of this AD to refer to Revision 2 as the appropriate source of service information for doing the required inspection, replacements, wiring changes, and corrective actions if necessary. We also have revised the applicability to refer to Revision 2 as the appropriate source of service information for determining the affected airplanes. In addition, we have added a new paragraph (g) to the AD (and redesignated subsequent paragraphs) to give operators credit for doing the actions required by paragraph (f) before