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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM172, Notice No. 25–161–SC]

Special Conditions: Boeing Model 747–200 (E–4B) 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 Boeing Model 747–200 (E–4B) airplanes. These airplanes, modified by S.I.P. Technical Services, Inc., will have novel and unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. The modification incorporates the installation of a new Flight Management System (FMS) and an Electronic Flight Instrumentation System (EFIS). 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 (HIRF). These special conditions provide the additional safety standards that the Administrator considers necessary to ensure that the critical functions that this system performs are maintained when the airplane is exposed to HIRF.

DATES: The effective date of these special conditions is April 24, 2000. Comments must be received on or before June 16, 2000.

ADDRESSES: Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM–114), Docket No. NM172, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; or delivered in duplicate to the Transport Airplane Directorate at the above address. Comments must be marked: Docket No. NM172. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4:00 p.m.

FOR FURTHER INFORMATION CONTACT: Ross Landes, FAA, Transport Airplane Directorate, Aircraft Certification Service, Standardization Branch, ANM–113, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; telephone (425) 227–1071; facsimile (425) 227–1149.

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 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 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. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to these special conditions must include with those comments a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket No. NM172.'' The postcard will be date stamped and returned to the commenter.

Background

On November 10, 1998, S.I.P. Technical Services, Inc., 10107 McAllister Freeway, San Antonio, Texas 78216–4648, applied for a supplemental type certificate (STC) to modify Boeing Model 747–200 (E–4B) airplanes listed on Type Certificate A20WE. The modification incorporates the installation of a new Flight Management System (FMS) and an Electronic Flight Instrumentation System (EFIS). The new FMS consists of three Flight Management Computers (FMC) and three Multi-Purpose Control Display Units (MCDU). The new EFIS consists of Active Matrix Liquid Crystal Display (AMLCD) Electronic Flight Instrument (EFI) units with embedded symbol generators and new control panels. The installation of these systems may be vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

Type Certification Basis

Under the provisions of 14 CFR 21.101, S.I.P. Technical Services, Inc. must show that Boeing Model 747–200 (E–4B) airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A20WE, 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 regulations incorporated by reference in Type Certificate No. A20WE are as follows:

The certification basis for the modified Boeing Model 747–200 (E–4B) airplanes include title 14 Code of Federal Regulations (14 CFR), part 25, effective February 1, 1965, as amended by Amendments 25–1 through 25–8, plus Amendments 25–15, 25–17, 25–18, 25–20, and 25–39.

In addition to the applicable airworthiness regulations and special conditions, the Model 747–200 (E–4B) must comply with the part 25 fuel vent and exhaust emission requirements of 14 CFR part 34 and the part 25 noise certification requirements of 14 CFR part 36.

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 Boeing Model 747–200 (E–4B) airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, are issued in accordance with § 11.49, as required by §§ 11.28 and 11.29(b), 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 S.I.P. Technical Services, Inc. apply for a supplemental

type certificate to modify any other model included on the same type certificate to incorporate the same novel or unusual design features, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

Novel or Unusual Design Features

The modified Boeing Model 747–200 (E–4B) airplanes will incorporate the following new design features: the installation of new Flight Management System (FMS) and Electronic Flight Instrumentation System (EFIS). The new FMS consists of three Flight Management Computers (FMC) and three Multi-purpose Control Display Units (MCDU). The new EFIS consists of Active Matrix Liquid Crystal Display (AMLCD) Electronic Flight Instrument (EFI) units with embedded symbol generators and new control panels. The installation of these systems may be vulnerable to 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 needed for the Boeing Model 747–200 (E–4B) airplanes. These special conditions require that new electrical and electronic systems, such as the FMS and EFIS 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

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 root-mean-square (rms) 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. 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
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 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 the Boeing Model 747–200 (E–4B) airplanes modified by S.I.P. Technical Services, Inc. Should S.I.P. Technical Services, Inc. apply at a later date for a supplemental type certificate to modify any other model included on the same type certificate to incorporate the same novel or unusual design features, these special conditions would apply to that model as well under the provisions of § 21.101(a)(1).

Conclusion

This action affects only certain novel or unusual design features on Boeing Model 747–200 (E–4B) airplanes modified by S.I.P. Technical Services, Inc. It is not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of the special conditions for this airplane has been subjected to the notice and comment procedure 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 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 type certification basis for Boeing Model 747–200 (E–4B) airplanes modified by S.I.P. Technical Services, Inc.

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 April 24, 2000.

Vi L. Lipski,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 00–10912 Filed 5–1–00; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2000–NM–01–AD; Amendment 39–11710; AD 2000–09–02]

RIN 2120–AA64

Airworthiness Directives; McDonnell Douglas Model DC–8 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain McDonnell Douglas Model DC–8 series airplanes that have been converted from a passenger to a cargo-carrying (''freighter'') configuration, that requires a revision to the Airplane Flight Manual Supplement to ensure that the main deck cargo door is closed, latched, and locked; an inspection of the door wire bundle; and repair or replacement of discrepant parts. This amendment also requires, among other actions, modification of the hydraulic and indication systems of the main deck cargo door, and installation of a means to prevent pressurization to an unsafe level if the main deck cargo door is not closed, latched, and locked. This amendment is prompted by the FAA's determination that certain main deck cargo door systems do not provide an adequate level of safety, and that the means to prevent pressurization to an unsafe level if the main deck cargo door is not closed, latched, and locked is inadequate. The actions specified by this AD are intended to prevent opening of the cargo door while the airplane is in flight, and consequent rapid decompression of the airplane including possible loss of flight control or severe structural damage.

EFFECTIVE DATE: June 6, 2000.

ADDRESSES: Information pertaining to this amendment may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; or at the FAA, Transport Airplane Directorate, Los Angeles Aircraft Certification Office, 3960 Paramount Boulevard, Lakewood, California.

FOR FURTHER INFORMATION CONTACT: Michael E. O'Neil, Aerospace Engineer, Airframe Branch, ANM–120L, FAA, Transport Airplane Directorate, Los Angeles Aircraft Certification Office, 3960 Paramount Boulevard, Lakewood, California 90712–4137; telephone (562) 627–5320; fax (562) 627–5210.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to certain McDonnell Douglas Model DC–8 series airplanes was published in the **Federal Register** on February 16, 2000 (65 FR 7796). That action proposed to require a revision to the Airplane Flight Manual Supplement to ensure that the main deck cargo door is closed, latched, and locked; an inspection of the door wire bundle; and repair or replacement of discrepant parts. That action also proposed to require, among other actions, modification of the hydraulic and indication systems of the main deck cargo door, and installation of a means to prevent pressurization to an unsafe level if the main deck cargo door is not closed, latched, and locked.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. No comments were submitted in response to the proposal or the FAA's determination of the cost to the public. The FAA has determined that air safety and the public interest require the adoption of the rule as proposed.

Cost Impact

There are approximately 6 Model DC–8 series airplanes of the affected design in the worldwide fleet. The FAA estimates that 6 airplanes of U.S. registry will be affected by this AD.

It will take approximately 1 work hour per airplane to accomplish the general visual inspections, at an average labor rate of $60 per work hour. Based on these figures, the cost impact of the general visual inspections required by this AD on U.S. operators is estimated to be $360, or $60 per airplane, per inspection cycle.

It will take approximately 1 work hour per airplane to accomplish the AFMS revision and installation of associated placards, at an average labor rate of $60 per work hour. Based on these figures, the cost impact of the AFM revision and installation of associated placards required by this AD on U.S. operators is estimated to be $360, or $60 per airplane.

The FAA estimates that it will take approximately 210 work hours per airplane to accomplish the modification required by paragraph (c) of this AD, at an average labor rate of $60 per work hour. The FAA also estimates that required parts will cost approximately $45,000 per airplane. Based on these figures, the cost impact of this modification required by this AD on U.S. operators is estimated to be $345,600, or $57,600 per airplane.

The cost impact figures discussed above are based on assumptions that no operator has yet accomplished any of the requirements of this AD action, and that no operator would accomplish those actions in the future if this AD were not adopted.

Regulatory Impact

The regulations adopted herein will not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

For the reasons discussed above, I certify that this action (1) is not a ''significant regulatory action'' under Executive Order 12866; (2) is not a ''significant rule'' under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption **ADDRESSES**.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

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