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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM211, Special Conditions No. 25-197-SC]

Special Conditions: Boeing Model 737-300, -400, and -500 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 737-300, -400, and -500 series airplanes modified by Hollingsead International. These airplanes 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 Rockwell Collins Global Navigation Landing Unit (GNLU-920) Multi-Mode Receiver (MMR) system. 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 provided by the existing airworthiness standards.

DATES: The effective date of these special conditions is February 25, 2002. Comments must be received on or before March 29, 2002.

ADDRESSES: Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-113), Docket No. NM211, 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. NM211. 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:

Gregory 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 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 9 a.m. and 5 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 in light of the comments we receive.

If you want the FAA to acknowledge receipt of your comments on this proposal, 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 to you.

Background

On January 8, 2002, Hollingsead International, 7416 Hollister Avenue, Goleta, California 93117, applied for a supplemental type certificate (STC) to modify Boeing Model 737-300, -400, and -500 series airplanes approved

under Type Certificate No. A16WE. The Model 737 series airplanes range from 101 feet, 9 inches long to 119 feet 7 inches in length and have a wingspan of 94 feet, 9 inches. The height at vertical stabilizer to ground is 36 feet, 6 inches. The passenger load is from 140 to 188 passengers, and the range is from 2785 to 3910 statute miles. The modification incorporates the installation of a dual Rockwell Collins GNLU-920 Multi-Mode Receiver (MMR) system. Each system consists of a Rockwell Collins GNLU-920 MMR and a Gables Engineering MMR Control Panel. The Rockwell Collins GNLU-920 MMR is a single integrated unit that enables approaches using instrument landing systems, microwave systems and global navigation satellite system functions. These functions can be susceptible to disruption to both command and response signals as a result of electrical and magnetic interference caused by high-intensity radiated fields (HIRF) external to the airplane. This disruption of signals could result in loss of critical flight displays and annunciations, or could present misleading information to the pilot.

Type Certification Basis

Under the provisions of 14 CFR 21.101, Hollingsead International must show that the Boeing Model 737-300, -400, and -500 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A16WE, 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 modified Boeing Model 737-300, -400, and -500 series airplanes includes 14 CFR part 25, dated November 14, 1984, as amended by amendments 25-1 through 25-51, except for special conditions and exceptions noted in Type Certificate Data Sheet (TCDS) A16WE.

If the Administrator finds that the applicable airworthiness regulations (that is, 14 CFR part 25, as amended) do not contain adequate or appropriate safety standards for the Boeing Model 737-300, -400, and -500 series airplanes because of novel or unusual design features, special conditions are

prescribed under the provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Boeing Model 737-300, -400, and -500 series airplanes must comply with the fuel vent and exhaust emission requirement of 14 CFR part 34 and the noise certification requirement of 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 14 CFR 21.101(b)(2).

Special conditions are initially applicable to the model for which they are issued. Should Hollingsead International apply at a later date 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 features, these special conditions would also apply to the other model under the provisions of 14 CFR 21.101(a)(1).

Novel or Unusual Design Features

The modified Boeing Model 737-300, -400, and -500 series airplanes will incorporate the Rockwell Collins GNLU-920 MMR system, which perform critical functions. The MMR System contains electronic equipment for which the current airworthiness standards (14 CFR part 25) do not contain adequate or appropriate safety standards that address protecting this equipment from the adverse effects of HIRF. Accordingly, these instruments are 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 Boeing Model 737-300, -400 and -500 series airplanes modified to include Rockwell Collins GNLU-920 MMR System. These special conditions will require that this new system, which 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, plus the advent of space and satellite communications, coupled with electronic command and control of the airplane, the immunity of critical digital avionic/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 in accordance 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 indicated in Table 1 for the frequency ranges indicated. Both peak and average field strength components from Table 1 are to be demonstrated.

TABLE 1

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

TABLE 1—Continued

Frequency	Field strength (volts per meter)	
	Peak	Average
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 Boeing Model 737-300, -400 and -500 series airplanes modified by Hollingsead International to include the Rockwell Collins GNLU-920 MMR. Should Hollingsead International apply at a later date for a supplemental type certificate to modify any other model already included on Type Certificate A16WE to incorporate the same novel or unusual design features, these special conditions would apply to that model as well under the provisions of 14 CFR 21.101(a)(1).

Conclusion

This action affects only certain design features on Boeing Model 737-300, -400 and -500 series airplanes modified by Hollingsead International. 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 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. 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 Boeing Model 737-300, -400 and -500 series airplanes modified by Hollingsead International.

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 February 25, 2002.

Vi L. Lipski,

Manager, Transport Airplane Directorate,
Aircraft Certification Service.

[FR Doc. 02-5626 Filed 3-7-02; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-41-AD; Amendment 39-12671; AD 2002-05-03]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-6, CF6-45, and CF6-50 Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD), that is applicable to General Electric Company (GE) CF6-6, CF6-45, and CF6-50 series turbofan engines, that currently requires revisions to the Time Limits Section of the manufacturer's Instructions for Continued Airworthiness (ICA) to include required

inspection of selected critical life-limited parts at each piece-part exposure. This amendment modifies the airworthiness limitations section of the manufacturer's manual and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements. A Federal Aviation Administration (FAA) study of in-service events involving uncontained failures of critical rotating engine parts has indicated the need for mandatory inspections. The mandatory inspections are needed to identify those critical rotating parts with conditions, which if allowed to continue in service, could result in uncontained failures. The actions specified by this AD are intended to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

DATES: Effective date April 12, 2002.

ADDRESSES: 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:

Karen Curtis, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7192, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION:

A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-08-11, Amendment 39-11697 (65 FR 21636, April 24, 2000), which is applicable to GE CF6-6, CF6-45, and CF6-50 series turbofan engines was published in the **Federal Register** on October 5, 2001 (66 FR 50912). That action proposed to modify the airworthiness limitations section of the manufacturer's manual and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements.

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.

Typographical Error

One commenter states that a typographical error exists in the referenced eddy current inspection (ECI) manual task number for HPT Stage 1 disk rim boltholes. The commenter suggests the task number be corrected

from 72-53-03-250-052 to 72-53-03-100-053.

The FAA partially agrees. The task number in the proposal is incorrect, however upon further review with the manufacturer, the correct task number is identified as 72-53-03-250-001-053. The task number suggested by the commenter refers to a preparatory cleaning task and not the intended ECI of the disk rim bolthole. The manufacturer will revise Chapter 05-21 of the manual by temporary revision (TR) to include the correct ECI task number, and this final rule is revised accordingly. The review with the manufacturer also found two other task number errors, which have been addressed by TR's and corrections in this final rule.

Time Limits Not Issued Yet

Four commenters approve of the proposal as-written. However, one of those commenters notes that the manufacturer has not yet issued the revisions to the Time Limits section of the engine manual to require the additional inspections in the proposal. The commenter thinks the revisions should already be issued.

The FAA partially agrees. The FAA is aware that the manufacturer has not yet issued revisions to the Time Limits sections of the engine manuals. However, the existing AD and this final rule allows the manufacturer up to 30 days after the effective date of the AD to issue the necessary revisions to the Time Limits sections. Therefore, no action is necessary to address the commenter's observation.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Economic Analysis

The FAA estimates that 730 engines installed on airplanes of U.S. registry would be affected by this AD, that it would take approximately 10 work hours per engine to accomplish the new inspections, and that the average labor rate is \$60 per work hour for a total approximate cost of \$600 per engine. It is further estimated that there will be about 299 shop visits per year that result in piece-part exposure of the additional affected components. Based on these figures, the total cost effect of the additional inspections on U.S. operators is estimated to be \$179,400.