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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM242, Special Conditions No. 25-225-SC]

Special Conditions: Raytheon Aircraft Company Model HS.125 Series 700A 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 Raytheon Aircraft Company Model HS.125 Series 700A airplanes modified by Elliott Aviation Technical Products Development, Inc. These modified airplanes will have a novel and 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 an Electronic Flight Instrument System (EFIS) for display of critical flight parameters (altitude, airspeed, and attitude) to the crew. 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 December 23, 2002. Comments must be received on or before February 3, 2003.

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. NM242, 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. NM242.

FOR FURTHER INFORMATION CONTACT:

Meghan Gordon, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; telephone (425) 227-2138; facsimile (425) 227-1149.

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 July 25, 2002, Elliott Aviation Technical Products Development, Inc., Quad City Airport, Moline, Illinois 61266-0100, applied for a supplemental type certificate (STC) to modify Raytheon Aircraft Company Model HS.125 Series 700A airplanes approved under Type Certificate No. A3EU. The HS.125 Series 700A airplanes are executive type transports that have two aft mounted turbine engines, a maximum passenger load of 15 passengers, and a maximum operating speed of 280 to 320 KTS depending on the fuel loading configuration. The modification incorporates the installation of the Rockwell Collins FDS 2000 Electronic Flight Instrument System (EFIS). This system uses flat information display panels for display of critical flight parameters (heading and attitude) to the crew. These displays 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 the loss of all critical flight information displays and annunciations or present misleading information to the pilot.

Type Certification Basis

Under the provisions of 14 CFR 21.101, Elliott Aviation Technical Products Development, Inc., must show that the Raytheon Aircraft Company Model HS.125 Series 700A airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A3EU, 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 Raytheon Aircraft Company Model HS.125 Series 700A airplanes include 14 CFR part 25 effective February 1, 1965, as amended

by Amendments 25-2 and 25-20, as described in Type Certificate Data Sheet A3EU.

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, 14 CFR part 25, as amended) do not contain adequate or appropriate safety standards for the Raytheon Aircraft Company Model HS.125 Series 700A airplanes because of novel or unusual design features, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Raytheon Aircraft Company Model HS.125 Series 700A 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 § 11.19, are issued in accordance with § 11.38 and become part of the type certification basis in accordance with § 21.101(b)(2), Amendment 21-69, effective September 16, 1991.

Special conditions are initially applicable to the model for which they are issued. Should Elliott Aviation Technical Products Development, Inc., apply at a later date for a supplemental type certificate to modify any other model included Type Certificate No. A3EU 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), Amendment 21-69, effective September 16, 1991.

Novel or Unusual Design Features

As noted earlier, the modified Raytheon Aircraft Company Model HS.125 Series 700A airplanes will incorporate the Rockwell Collins FDS 2000 Electronic Flight Instrument System (EFIS). Because these advanced systems use electronics to a far greater extent than the original flight and navigation systems, they may be more susceptible to electrical and magnetic interference caused by high-intensity radiated fields (HIRF) 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 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 Raytheon Aircraft Company Model HS.125 Series 700A airplanes modified by Elliott Aviation Technical Products Development, Inc. These special conditions will require that the new EFIS that performs 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/electronic 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 indicated in the table below for the frequency ranges indicated. Both peak and average field strength components from the table below 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 |

| Frequency | Field strength (volts per meter) | |
|--------------------|----------------------------------|---------|
| | Peak | Average |
| 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 Raytheon Aircraft Company Model HS.125 Series 700A airplanes modified by Elliott Aviation Technical Products Development, Inc. Should Elliott Aviation Technical Products Development, Inc., apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A3EU to incorporate 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), Amendment 21-69, effective September 16, 1991.

Conclusion

This action affects only certain novel or unusual design features on Raytheon Aircraft Company Model HS.125 Series 700A airplanes modified by Elliott Aviation Technical Products Development, Inc. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on this 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 Raytheon Aircraft Company Model HS.125 Series 700A airplanes modified by Elliott Aviation Technical Products Development, 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 December 23, 2002.

Charles Huber,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 03-63 Filed 1-2-03; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2002-NM-84-AD; Amendment 39-13005; AD 2002-26-17]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 747 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD),

applicable to certain Boeing Model 747 series airplanes, that currently requires a one-time inspection to identify all alloy steel bolts on the body station 1480 bulkhead splice, and corrective action if necessary; and provides for optional terminating action for certain requirements of that AD. This amendment requires accomplishment of the previously optional terminating action. The actions specified by this AD are intended to prevent cracked or broken bolts, which could result in structural damage and rapid depressurization of the airplane. This action is intended to address the identified unsafe condition.

DATES: Effective February 7, 2003.

The incorporation by reference of certain publications, as listed in the regulations, was approved previously by the Director of the Federal Register as of May 8, 2002 (67 FR 19641, April 23, 2002).

ADDRESSES: The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Rick Kawaguchi, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-1153; fax (425) 227-1181.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2002-08-10, amendment 39-12718 (67 FR 19641, April 23, 2002), which is applicable to certain Boeing Model 747 series airplanes, was published in the **Federal Register** on June 21, 2002 (67 FR 42204). The action proposed to continue to require a one-time inspection to identify all alloy steel bolts on the body station (BS) 1480 bulkhead splice, and corrective action if necessary. That action also proposed to mandate the previously optional terminating action.

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 Remove Paragraph (f)

One commenter asks that paragraph (f) of the proposed AD be removed. The commenter states that paragraph (c) of the proposed AD conflicts with paragraph (f) because paragraph (f) states, "As of the effective date of this AD, no person may install an alloy steel bolt on the BS 1480 bulkhead splice on any airplane." The commenter notes that Boeing Alert Service Bulletin 747-53A2390, Revision 1, is referenced as the applicable source of service information in AD 2001-11-06, amendment 39-12248 (66 FR 31124, July 16, 2001); that AD is specified in paragraph (c) of the proposed AD. The commenter adds that paragraph (c) allows reinstallation of alloy steel bolts following a magnetic particle inspection, which creates the conflict between paragraphs (c) and (f).

The FAA partially agrees with the commenter. We agree that there is some inconsistency between the requirements of paragraphs (c) and (f) of the proposed AD, but we do not agree that paragraph (f) should be removed. The inspections to identify alloy steel bolts, as required by paragraph (a) of the proposed AD, are one-time only. An operator could install new alloy steel bolts in areas previously identified as having Inconel 718 bolts after doing the inspection. Unless proper records are maintained, an operator will not know whether the repetitive inspections of alloy steel bolts with no cracking, which is corrective action for the inspection required by paragraph (a), would apply. For clarification, we have changed paragraph (f) in this final rule to state, "Except as provided by paragraph (c) of this AD: As of the effective date of this AD, no person may install an alloy steel bolt on the BS 1480 bulkhead splice on any airplane."

Request to Change Paragraph (a)

One commenter asks that paragraph (a) of the proposed AD be changed to remove the term "detailed methods" as an inspection that can be used for identification of an alloy steel bolt. The commenter states that the referenced service bulletin contains no detailed instructions for identifying the bolts by a detailed visual inspection. The commenter adds that an operator may be able to identify the bolt by a visual inspection, but only if the operator knows the bolt codes marked on the heads of the alloy steel bolts.

We do not agree with the commenter. On page 34 of the referenced service bulletin, instructions are provided for a detailed inspection, including the bolt codes for identifying alloy steel bolts for