

Conclusion

This action affects only certain novel or unusual design features on Gulfstream Aerospace Corporation Model G-1159B airplanes modified by ElectroSonics. 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 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 Gulfstream Aerospace Corporation Model G-1159B airplanes modified by ElectroSonics.

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 October 24, 2001.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM199; Special Conditions No. 25-188-SC]

Special Conditions: Boeing 747-200/-300 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/-300 series airplanes modified by Hollingsead International, Inc. These modified airplanes will have a novel or 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 new Liquid Crystal Flight Instruments as Attitude Directional Indicators (ADI), the Horizontal Situation Indicators (HSI) and Engine Display Interface System (EDIS). The liquid crystal flight instruments will utilize electrical and electronic systems that perform critical functions. 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 established by the existing airworthiness standards.

DATES: The effective date of these special conditions is October 25, 2001. Comments must be received on or before December 24, 2001.

ADDRESSES: Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM-113), Docket No. NM199, 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. NM199. 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: Greg 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) 227-1149.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because these procedures would significantly delay certification of the airplane and thus delivery of the affected aircraft. 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 rules docket number and be submitted in duplicate to the address specified above. The Administrator will consider all communications received on or before the closing date for comments. 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. 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. NM199." The postcard will be date stamped and returned to the commenter.

Background

On October 13, 1997, Hollingsead International, Inc., 7416 Hollister Avenue, Goleta, California 93117-2538, applied for a Supplemental Type Certificate (STC) for the Boeing Model 747-200/-300 series airplanes. The Boeing Model 747-200/-300 series airplanes are equipped with four CF650E2 turbofan engines. The aircraft have a crew of three with additional seating for one, consisting of a jump seat in the cockpit. The aircraft are operated by KLM Royal Dutch airlines in "freighter," "combi," and "full

passenger" configurations. The Boeing 747-200/-300 airplanes will incorporate Smiths Industries 5-ATI liquid crystal flight instruments. The modified airplanes are scheduled for certification in November 2001.

The functions of the liquid crystal flight instruments can be susceptible to disruption of both command and response signals as a result of electrical and magnetic interference caused by 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, Inc., must show that the Boeing 747-200/-300 series 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 included in the certification basis for the Boeing Model 747-200/-300 series airplanes include 14 CFR part 25, as amended by Amendment 25-1 through Amendment 25-91.

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 747-200/300 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Boeing Model 747-200/-300 series airplanes must comply with the fuel vent and exhaust emission

requirement of 14 CFR part 34 and the noise certification requirement of 14 CFR part 36.

Special conditions, as defined in § 11.19, are issued in accordance with § 11.38 and become part of the airplane's 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 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 § 21.101(a)(1).

Novel or Unusual Design Features

The Boeing Model 747-200/-300 series airplanes will incorporate the Smiths Industries 5-ATI liquid crystal flight instruments as ADI, HSI and EDIS, which perform critical functions. The liquid crystal flight instruments contain 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. These instruments may be vulnerable to HIRF external to the airplane. 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 that is equivalent to that intended by the regulations incorporated by reference, special

conditions are needed for the Boeing Model 747-200/-300 airplanes modified to include the Smiths Industries 5-ATI liquid crystal flight instruments as ADI, HSI and EDIS. These special conditions will require that these instruments, 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 avionics/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 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 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

Frequency	Field strength (volts per meter)	
	Peak	Average
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/–300 series airplanes modified by Hollingsead International, Inc. to include the Smiths Industries 5–ATI liquid crystal flight instruments, as ADI, HSI and EDIS. Should Hollingsead International apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A20WE 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 the Boeing Model 747–200/–300 series airplanes modified by Hollingsead International, 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 the airplanes.

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. 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.

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Issued in Renton, Washington, on October 25, 2001.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2001–CE–04–AD; Amendment 39–12495; AD 2001–22–16]

RIN 2120–AA64

Airworthiness Directives; Raytheon Aircraft Company Beech Models 1900, 1900C (C–12J), and 1900D Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes Airworthiness Directive (AD) 95–02–18, which applies to certain Raytheon Aircraft Company (Raytheon) Beech Models 1900, 1900C (C–12J), and 1900D airplanes. AD 95–02–18 requires you to repetitively inspect the engine truss assemblies for cracks, repair or replace any cracked engine truss assembly, and install reinforcement doublers. This AD requires engine truss assembly replacement, periodic inspections and replacements, and the eventual incorporation of a cowl support installation kit as terminating action. The repetitive inspections of AD 95–02–18 will be retained until mandatory engine truss assembly replacement. This AD is the result of continued reports of fatigue cracks found on engine trusses on airplanes in compliance with AD 95–02–18. The actions specified by this AD are intended to detect and correct cracked engine truss assemblies, which could result in failure of the engine truss assembly and consequent loss of airplane control.

DATES: This AD becomes effective on December 17, 2001.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of December 17, 2001.

ADDRESSES: You may obtain the service information referenced in this AD from Raytheon Aircraft Company, P.O. Box 85, Wichita, Kansas 67201–0085; telephone: (800) 625–7043 or (316) 676–4556. You may view this information at the Federal Aviation Administration (FAA), Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 2001–CE–04–AD, 901 Locust, Room 506, Kansas City, Missouri 64106; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: David L. Ostrodka, Aerospace Engineer, FAA, Wichita Aircraft Certification Office, 1801 Airport Road, Mid-Continent Airport, Wichita, Kansas 67209; telephone: (316) 946–4129; facsimile: (316) 946–4407.