Rules and Regulations

Federal Register
Vol. 67, No. 219
Wednesday, November 13, 2002

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM239; Special Conditions No. 25–223–SC

Special Conditions: Embraer Model 170–100 and 170–200 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 the Embraer Model 170–100 and 170–200 airplanes. These airplanes will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. The airplane design includes an electronic flight control system as well as advanced avionics for the display and control of critical airplane 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. Additional special conditions will be issued for other novel or unusual design features of Embraer Model 170–100 and 170–200 airplanes.

DATES: The effective date of these special conditions is November 1, 2002. Comments must be received on or before December 13, 2002.

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. NM239, 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. NM239. 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: Tom Groves, FAA, International Branch, ANM–116, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055–4056; telephone (425) 227–1503; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA has determined that notice and opportunity for prior public comment hereon is unnecessary as 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 such written comments, data, or views, as they may desire. 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 in light of 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 May 20, 1999, Embraer applied for a type certificate for its new Model 170 airplane. Two basic versions of the Model 170 are included in the application. The Model 170–100 airplane is a 69–78 passenger twin-engine regional jet with a maximum takeoff weight of 81,240 pounds. The Model 170–200 is a lengthened fuselage derivative of the 170–100. Passenger capacity for the Model 170–200 is increased to 86, and maximum takeoff weight is increased to 85,960 pounds. Embraer Model 170–100 and 170–200 airplanes will include an electronic flight control system as well as advanced avionics for the display and control of critical airplane functions. These systems may be vulnerable to high-intensity radiated fields (HIRF) external to the airplane.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Embraer must show that Model 170–100 and 170–200 airplanes meet the applicable provisions of 14 CFR part 25, as amended by Amendments 25–1 through 25–98.

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, part 25, as amended) do not contain adequate or appropriate safety standards for Embraer Model 170–100 and 170–200 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, Embraer Model 170–100 and 170–200 airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36, and the FAA must issue a finding of regulatory adequacy pursuant to § 611 of Pub. L. 93–574, the ''Noise Control Act of 1972.''

Special conditions, as defined in 14 CFR 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), Amendment 21–69, effective September 16, 1991.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, or should any other model already included on the same type certificate be modified 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, Embraer Model 170–100 and 170–200 airplanes will include an electronic flight control system as well as advanced avionics for the display and control of critical airplane functions. These systems may be vulnerable to high-intensity radiated fields (HIRF) external to the airplane. The current airworthiness standards of part 25 do not contain adequate or appropriate safety standards that address the protection of this equipment from the adverse effects of HIRF. Accordingly, these systems are considered to be novel or unusual design features.

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 Embraer Model 170–100 and 170–200 airplanes. These special conditions require that avionics/electronics and electrical systems 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 (HIRF)

With the trend toward increased power levels from ground-based transmitters and 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 (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 are to be demonstrated.

Frequency	Field strength (volts per meter)	
	Peak	Average
10 kHz–100kHz	50	50
100 kHz–500 kHz	50	50
500 kHz–2 MHz	50	50
2 MHz 2–30 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 Embraer Model 170–100 and 170–200 airplanes. Should Embraer apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well, under the provisions of § 21.101(a)(2), Amendment 21–69, effective September 16, 1991.

Conclusion

This action affects only certain novel or unusual design features of the Embraer Model 170–100 and 170–200 airplanes. It is not a rule of general applicability, and it affects only the applicant which 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 procedure in several prior instances and has been derived without substantive change from those previously issued. The FAA has determined that prior public notice and comment are unnecessary, and that 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 Embraer Model 170–100 and 170–200 airplanes.

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 November 1, 2002.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 02–28824 Filed 11–12–02; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2002–NM–265–AD; Amendment 39–12945; AD 2002–23–01]

RIN 2120–AA64

Airworthiness Directives; Gulfstream Aerospace LP Model Galaxy and Gulfstream 200 Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment adopts a new airworthiness directive (AD) that is applicable to certain Gulfstream Aerospace LP Model Galaxy and Gulfstream 200 airplanes. This action requires a one-time inspection for evidence of damage to the forward engine cross spar assembly; and repair if necessary. This action is necessary to detect and correct damage to the forward engine cross spar assembly, which could result in reduced structural integrity of the forward engine cross spar assembly. This action is intended to address the identified unsafe condition.

DATES: Effective November 29, 2002.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of November 29, 2002.

Comments for inclusion in the Rules Docket must be received on or before December 13, 2002.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Transport Airplane Directorate, ANM–114, Attention: Rules Docket No. 2002–NM–265–AD, 1601 Lind Avenue, SW., Renton, Washington 98055–4056. Comments may be inspected at this location between 9 a.m. and 3 p.m., Monday through Friday, except Federal holidays. Comments may be submitted via fax to (425) 227–1232. Comments may also be sent via the Internet using the following address: *9-anm-iarcomment@faa.gov.* Comments sent via fax or the Internet must contain ''Docket No. 2002–NM–265–AD'' in the subject line and need not be submitted in triplicate. Comments sent via the Internet as attached electronic files must be formatted in Microsoft Word 97 for Windows or ASCII text.

The service information referenced in this AD may be obtained from Gulfstream Aerospace Corporation, P.O. Box 2206, Mail Station D25, Savannah, Georgia 31402. This information may be examined at the FAA, Transport Airplane Directorate, 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: Dan Rodina, Aerospace Engineer, International Branch, ANM–116, FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–2125; fax (425) 227–1149.

SUPPLEMENTARY INFORMATION: The Civil Aviation Administration of Israel (CAAI), which is the airworthiness authority for Israel, recently notified the FAA that an unsafe condition may exist on certain Gulfstream Model Galaxy and Gulfstream 200 airplanes. The CAAI advises that, during the installation of the mounting brackets for the baggage compartment liner, damage occurred to the upper beam cap of the forward engine cross spar assembly, located at fuselage station 582.00. The damage may have been a result of drill runs, and, if not corrected, could result in reduced structural integrity of the forward engine cross spar assembly.

Explanation of Relevant Service Information

Gulfstream has issued Gulfstream 200 Service Bulletin 200–53–128, dated September 18, 2002, including a Service Reply Card, which describes procedures for performing a one-time detailed inspection for evidence of damage (*i.e.*, drill marks) to the forward engine cross spar assembly at fuselage station 582.00; and contacting the airplane manufacturer for repair instructions, if necessary. The service bulletin recommends that operators submit a report verifying completion of the actions. Accomplishment of the actions specified in the service bulletin is intended to adequately address the identified unsafe condition. The CAAI classified this service bulletin as mandatory and issued Israeli airworthiness directive 53–02–08–08, dated September 10, 2002, in order to assure the continued airworthiness of these airplanes in Israel.

FAA's Conclusions

These airplane models are manufactured in Israel and are type certificated for operation in the United States under the provisions of section 21.29 of the Federal Aviation Regulations (14 CFR 21.29) and the applicable bilateral airworthiness agreement. Pursuant to this bilateral airworthiness agreement, the CAAI has kept the FAA informed of the situation described above. The FAA has examined the findings of the CAAI, reviewed all available information, and determined that AD action is necessary for products of this type design that are certificated for operation in the United States.

Explanation of Requirements of Rule

Since an unsafe condition has been identified that is likely to exist or develop on other airplanes of the same type design registered in the United States, this AD requires accomplishment of the actions specified in the service bulletin described previously, except as discussed below.

Differences Between This AD and Service Bulletin/Foreign Airworthiness Directive

This AD differs from the parallel Israeli airworthiness directive and Gulfstream 200 service bulletin in that, if damage is found to the forward engine cross spar assembly, and repair is necessary, the repair must be accomplished prior to further flight. The service bulletin and the Israeli airworthiness directive allow the repair to be accomplished after an additional 2 flight cycles, not to exceed 10 flight hours. The FAA has determined that, because of the safety implications and consequences associated with this type of damage, any damage on the affected airplanes must be repaired prior to further flight. This difference has been coordinated with the CAAI.

Clarification of Repair Information in Service Bulletin

Operators should note that, although the service bulletin specifies that the manufacturer may be contacted for disposition of repair methods, this AD requires that the repair be accomplished in accordance with a method approved by the FAA or the CAAI (or its delegated agent).

Determination of Rule's Effective Date

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good