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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM194; Special Conditions No. 25-184-SC]

Special Conditions: Boeing Model 727-200 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 Boeing Model 727-200 airplanes modified by Aircraft Systems & Manufacturing. 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 a new electronic air data system, consisting of an electronic Horizontal Situation Indicator (HSI) and dual air data computers, that performs 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 September 24, 2001. Comments must be received on or before October 10, 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. NM194, 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. NM194. 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: 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: The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because these procedures would significantly delay issuance of the approval design 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.

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. NM194." The postcard will be date stamped and returned to the commenter.

Background

On February 6, 2001, Aircraft Systems & Manufacturing, 302 Toledo Trail Drive, Georgetown, Texas, 78628, applied for a Supplemental Type Certificate (STC) to modify Boeing Model 727-200 airplanes. These airplanes are low-wing, pressurized transport category airplanes with three fuselage-mounted jet engines. They are capable of seating between 170 and 189 passengers, depending upon the model and configuration. The modification incorporates the installation of a new electronic air data system consisting of an electronic Horizontal Situation Indicator (HSI) and dual air data computers. The avionics/electronics and electrical systems installed in this airplane have the potential to be vulnerable to high-intensity radiated fields (HIRF).

Type Certification Basis

Under the provisions of 14 CFR 21.101, Aircraft Systems & Manufacturing must show that the Boeing Model 727-200 series airplanes, as modified to include the new electronic air data system, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A3WE 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 specific regulations included in the certification basis for the Boeing Model 727-200 series airplanes include Civil Air Regulations (CAR) 4b, as amended by amendment 4b-1 through 4b-11.

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, CAR 4b, as amended) do not contain adequate or appropriate safety standards for the Boeing Model 727-200 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 727-200 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.

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 Aircraft Systems & Manufacturing 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 feature, these special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

Novel or Unusual Design Features

As noted earlier, the Boeing 727-200 airplanes modified by Aircraft Systems & Manufacturing will incorporate a new electronic air data system, consisting of an electronic HSI and dual air data computers, that will perform critical functions. This system may be vulnerable to high-intensity radiated fields. 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 requirements for protection of 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 that is equivalent to that intended by the regulations incorporated by reference, special conditions are needed for the Boeing Model 727-200 series airplanes modified by Aircraft Systems & Manufacturing. These special conditions will require that this system, which performs critical functions, must 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 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 flight deck-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 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
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 727-200 series airplanes modified by Aircraft Systems & Manufacturing to install a new

electronic air data system. Should Aircraft Systems & Manufacturing apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A3WE 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).

Conclusion

This action affects only certain design features on the Boeing Model 727-200 series airplanes modified by Aircraft Systems & Manufacturing to include the new electronic air data system. 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 the special conditions for these airplanes 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 immediately. Therefore, these special conditions are being made effective 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 the Boeing Model 727-200 series airplanes as modified by Aircraft Systems & Manufacturing.

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 August 24, 2001.

Ali Bahrami,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 01-22661 Filed 9-7-01; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2000-NM-246-AD; Amendment 39-12427; AD 2001-18-01]

RIN 2120-AA64

Airworthiness Directives; Airbus Model A340-211 Series Airplanes Modified by Supplemental Type Certificate ST09092AC-D

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to all Airbus Model A340-211 series airplanes modified by supplemental type certificate ST09092AC-D, that requires modifying the passenger entertainment system (PES) and revising the Flight Crew Operating Manual. This action is necessary to ensure that the flight crew is able to remove electrical power from the entire PES when necessary and is advised of appropriate procedures for such action. Inability to remove power from the PES during a non-normal or emergency situation could result in inability to control smoke or fumes in the airplane flight deck or cabin. This action is intended to address the identified unsafe condition.

DATES: Effective October 15, 2001.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of October 15, 2001.

ADDRESSES: The service information referenced in this AD may be obtained

from Raytheon Systems Company, Intelligence Information and Aircraft Integration Systems, 7500 Maehre Road, Waco, Texas 76705. This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; at the FAA, Fort Worth Airplane Certification Office, 2601 Meacham Blvd., Fort Worth, Texas; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT:

Ingrid Knox, Aerospace Engineer, FAA, Fort Worth Airplane Certification Office, ASW-150, 2601 Meacham Blvd., Fort Worth, Texas 76137-4298; telephone (817) 222-5139; fax (817) 222-5960.

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 all Airbus Model A340-211 series airplanes modified by supplemental type certificate (STC) ST09092AC-D was published in the **Federal Register** on March 2, 2001 (66 FR 13222). That action proposed to require modifying the passenger entertainment system (PES) and revising the Flight Crew Operating Manual.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the single comment received.

Omit Reference to the Foreign Airworthiness Authority

The commenter requests that the FAA revise the final rule to omit the references to the Direction Générale de l'Aviation Civile (DGAC), which is the airworthiness authority for France. The commenter points out that the PES system that is the subject of the proposed AD was approved by an American STC; thus, the DGAC is not the primary airworthiness authority for the STC as the proposed rule states.

We concur. The references in the proposed rule to the DGAC were included in error. However, the sections that contained the subject references are not restated in this final rule. Therefore, no change to the final rule is necessary.

Conclusion

After careful review of the available data, including the comment noted above, the FAA has determined that air safety and the public interest require the adoption of the rule as proposed.

Cost Impact

None of the airplanes affected by this action are on the U.S. Register. The single airplane included in the applicability of this AD currently is operated by a non-U.S. operator under foreign registry; therefore, it is not directly affected by this AD action. However, the FAA considers that this rule is necessary to ensure that the unsafe condition is addressed in the event that the subject airplane is imported and placed on the U.S. Register in the future.

Should the affected airplane be imported and placed on the U.S. Register in the future, it will take approximately 28 work hours to accomplish the modification, at an average labor rate of \$60 per work hour. Required parts will cost approximately \$162,597 per airplane. Based on these figures, the cost impact of the required modification would be \$164,277.

Should the affected airplane be imported and placed on the U.S. Register in the future, it will take approximately 1 work hour to accomplish the manual revision, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of the required manual revision would be \$60.

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. The cost impact figures discussed in AD rulemaking actions represent only the time necessary to perform the specific actions actually required by the AD. These figures typically do not include incidental costs, such as the time required to gain access and close up, planning time, or time necessitated by other administrative actions.

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)