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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM-163; Special Conditions No. 25-147-SC]

Special Conditions: Rockwell Collins; Boeing Model 737-300/-400/-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/-500 series airplanes modified by Rockwell Collins. These modified airplanes will have a novel or unusual design feature associated with the Rockwell Collins Multi-Mode Receiver (MMR) System. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. 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 August 23, 1999. Comments must be received on or before October 1, 1999.

ADDRESSES: Comments on these special conditions may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM-114), Docket No. NM-163, 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. NM-163. 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: Mark Quam, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98055-4056; telephone (425) 227-2145; facsimile (425) 227-1149.

SUPPLEMENTARY INFORMATION:

FAA's Determination as to Need for Public Process

The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because those procedures would significantly delay issuance of the approval design and, thus, the delivery of the affected aircraft. (The aircraft are scheduled for delivery in mid-September 1999.)

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. Thus, the FAA has previously provided the public with a number of opportunities to comment on proposed special conditions that are substantively identical to those at issue; and the FAA is reasonably assured that all interested members of the public have had an opportunity to comment and that their comments have been fully considered. The FAA, therefore, finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

Although this action is in the form of final special conditions and, for the reasons stated above, is not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to submit such written data, views, or arguments as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. 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. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket NM-163." The postcard will be date stamped and returned to the commenter.

Background

On October 15, 1998, Rockwell Collins, Business and Regional Systems, 400 Collins Road NE., Cedar Rapids, Iowa 52498, made application to the FAA for a Supplemental Type Certificate (STC) for the Boeing Model 737-300/-400/-500 series airplanes. These airplanes are low-wing, pressurized transport category airplanes with twin, wing-mounted, jet engines. They are capable of seating between 110 and 147 passengers, depending upon the model and configuration. The proposed configuration of these modified airplanes will incorporate a Multi-Mode Receiver (MMR) system manufactured by Rockwell Collins. The affected aircraft are scheduled for delivery to the first customers in mid-September 1999.

The Rockwell Collins MMR is a single integrated unit that enables approaches using instrument landing systems, microwave landing systems, and global navigation satellite system functions. These functions can be susceptible to disruption of 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 ("Designation of applicable regulations"), Rockwell Collins must show that the Boeing Model 737-300/-400/-500 series airplanes, as modified to include the MMR installation, 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 specific regulations included in the certification basis for the Boeing Model 737-300/-400/-500 series airplanes include 14 CFR part 25, as amended by amendment 25-1 through 25-3, 25-7, 25-8, and 25-15.

Purpose of Special Conditions

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Boeing Model 737-300/-400/-500 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16 ("Special conditions").

In addition to the applicable airworthiness regulations and special conditions, the Boeing Model 737-300/-400/-500 must comply with the part 25 fuel vent and exhaust emission requirements of 14 CFR part 34, and the part 25 noise certification requirements of 14 CFR part 36.

Special conditions, as appropriate, are issued in accordance with § 11.49, as required by §§ 11.28 and 11.29, 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 Rockwell Collins 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

The modified Boeing Model 737-300/-400/-500 series airplanes will incorporate the Rockwell Collins MMR system, which performs 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, 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 737-300/-400/-500 airplanes modified to include the Rockwell Collins MMR system. 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 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 per meter peak 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.

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 root-mean-square (rms) values.

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. In general, these standards are less critical than the threat level that was previously used as the basis for some earlier special conditions.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 737-300/-400/-500 series airplanes modified by Rockwell Collins to include the MMR system. Should Rockwell Collins apply at a later date for a design change approval to modify any other model that may be included on Type Certificate A16WE and 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)(1).

Conclusion

This action affects only certain design features on the Boeing 737-300/-400/-500 airplanes as modified to include the Rockwell Collins MMR system installation. 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 737-300/-400/-500 series airplanes as modified by Rockwell Collins to include the Rockwell Collins Multi-Mode Receiver.

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 operations 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 23, 1999.

Vi L. Lipski,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 99-22751 Filed 8-31-99; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 96-NM-113-AD; Amendment 39-11270; AD 99-18-04]

RIN 2120-AA64

Airworthiness Directives; Dornier Model 328-100 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain Dornier Model 328-100 series airplanes, that requires repetitive inspections to detect cracking of the support beam of the main landing gear (MLG) fairing, and a permanent repair, if necessary. This AD also requires installation of reinforcement parts for the longitudinal beam of the MLG fairing, which terminates the requirements of this AD. This amendment is prompted by the issuance of mandatory continuing airworthiness information by a foreign civil airworthiness authority. The actions specified by this AD are intended to prevent cracking of the support beam of the MLG fairing, which could result in

reduced structural integrity of the lower part of the MLG fairing, and consequent separation of part of the fairing from the airplane and possible damage to the airplane or injury to persons on the ground.

DATES: Effective October 6, 1999.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of October 6, 1999.

ADDRESSES: The service information referenced in this AD may be obtained from Fairchild Dornier, Dornier Luftfahrt GmbH, P.O. Box 1103, D-82230 Wessling, Germany. 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: Norman B. Martenson, Manager, International Branch, ANM-116, FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2110; fax (425) 227-1149.

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 certain Dornier Model 328-100 series airplanes was published as a supplemental notice of proposed rulemaking (NPRM) in the **Federal Register** on June 9, 1998 (63 FR 31382). That action proposed to require repetitive inspections to detect cracking of the support beam of the main landing gear (MLG) fairing, and a permanent repair, if necessary. That action also proposed to require installation of reinforcement parts for the longitudinal beam of the MLG fairing, which would terminate the requirements of the AD. In addition, that action proposed to limit the applicability of the original NPRM.

Comments Received

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 Revise Compliance Time

The manufacturer provides an additional statement to comments submitted in response to the original NPRM regarding continued flight after detection of cracking. The manufacturer notes that inspections, repair, and reinforcement of the support beam of the MLG fairing are intended to prevent