

Rules and Regulations

Federal Register

Vol. 64, No. 13

Thursday, January 21, 1999

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM151; Special Conditions No. 25-142-SC]

Special Conditions: Boeing Model 757-300 Sudden Engine Stoppage

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Model 757-300 airplane. This airplane will have a novel or unusual design feature associated with sudden engine stoppage. 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.

EFFECTIVE DATE: January 14, 1999.

FOR FURTHER INFORMATION CONTACT: Joe Jacobsen, FAA, Standardization Branch, ANM-113, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; telephone (425) 227-2011; facsimile (425) 227-1149.

SUPPLEMENTARY INFORMATION:

Background

On February 21, 1996, Boeing applied for an amendment to Type Certificate No. A2NM to include the new Model 757-300 airplane, a derivative of the Model 757-200 currently approved under Type Certificate No. A2NM. The Model 757-300 airplane is a swept wing, conventional tail, twin engine, turbofan powered transport. Each engine will be capable of delivering

43,100 pounds of thrust. The airframe has been strengthened to accommodate the increased design loads and weights. The airplane has a seating capacity of up to 295, and a maximum takeoff weight of 270,000 pounds (122,470 Kg).

Type Certification Basis

Under the provisions of 14 CFR 21.101, Boeing must show that the Model 757-300 airplane meets the applicable provisions of the regulations incorporated by reference in Type Certificate No. A2NM, or the applicable regulations in effect on the date of application for the change to the Model 757-300. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The regulations incorporated by reference in Type Certificate No. A2NM include part 25, as amended by Amendments 25-1 through 25-45, and certain other later amended sections of part 25 that are not relevant to these special conditions. In addition, Boeing has chosen to comply with the applicable regulations in effect on February 21, 1996; specifically part 25 as amended by Amendments 25-1 through 25-85 and certain other earlier amended sections of part 25 that are not relevant to these special conditions. Three exemptions have been granted. These special conditions form an additional part of the type certification basis.

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 757-300 airplane 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 Model 757-300 airplane must comply with the fuel vent and exhaust emission requirements of part 34, effective September 10, 1990, plus any amendments in effect at the time of certification; and the noise certification requirements of part 36, effective December 1, 1969, as amended by Amendment 36-1 through the amendment in effect at the time of certification.

Special conditions, as appropriate, are issued in accordance with 14 CFR 11.49 after public notice, as required by §§ 11.28 and 11.29(b), and become part

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

Novel or Unusual Design Features

The engine proposed for the Boeing Model 757-300 airplane is a high-bypass ratio fan jet engine that will not seize and produce transient torque loads in the same manner that is envisioned by current § 25.361(b)(1) related to "sudden engine stoppage."

Discussion

For the engine proposed for the Model 757-300 airplanes, the limit engine torque load imposed by sudden engine stoppage due to malfunction or structural failure (such as compressor jamming) has been a specific requirement for transport category airplanes since 1957. The size, configuration, and failure modes of jet engines has changed considerably from those envisioned in 14 CFR 25.361(b) when the engine seizure requirement was first adopted. Engines have grown much larger and are now designed with large bypass fans capable of producing much higher torque loads if they become jammed.

Relative to the engine configuration that existed when the rule was developed in 1957, the present generation of engines are sufficiently different and novel to justify issuance of a special condition to establish appropriate design standards. The latest generation of jet engines are capable of producing engine seizure torque loads that are significantly higher than previous generations of engines.

The FAA is developing a new regulation and a new advisory circular that will provide more comprehensive criteria for treating engine torque loads resulting from sudden engine stoppage. In the meantime, a special condition is needed to establish appropriate criteria for the Boeing Model 757-300 airplane.

Limit Engine Torque Loads for Sudden Engine Stoppage

In order to maintain the level of safety envisioned by § 25.361(b), more comprehensive criteria are needed for the new generation of high bypass engines. These special conditions distinguish between the more common seizure events and those rare seizure events resulting from structural failures in the engine. For these more rare but severe seizure events, the criteria would allow some deformation in the engine supporting structure (ultimate load design) in order to absorb the higher energy associated with the high bypass engines, while at the same time protecting the adjacent primary structure in the wing and fuselage by applying a higher factor of safety to the maximum torque load imposed by sudden engine stoppage due to a structural failure.

Discussion of Comments

Notice of proposed special conditions No. 25-98-04-SC for the Boeing Model 757-300 airplanes was published in the **Federal Register** on December 10, 1998 (63 FR 68211). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 757-300. Should Boeing 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)(1).

Under standard practice, the effective date of final special conditions is 30 days after the date of publication in the **Federal Register**; however, as the certification date for the Boeing Model 757-300 is imminent, the FAA finds that good cause exists to make these special conditions effective upon issuance.

Conclusion

This action affects only certain novel or unusual design features on one model series of airplanes. It is not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

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 Boeing Model 757-300 airplanes.

1. *Engine Torque Loads.* In lieu of compliance with § 25.361(b), compliance with the following special condition is proposed:

(a) For turbine engine installations, the mounts and local supporting structure must be designed to withstand each of the following:

(1) The maximum torque load, considered as limit, imposed by:

(i) sudden deceleration of the engine due to a malfunction that could result in a temporary loss of power or thrust capability, and that could cause a shutdown due to vibrations; and

(ii) the maximum acceleration of the engine.

(2) The maximum torque load, considered as ultimate, imposed by sudden engine stoppage due to a structural failure, including fan blade failure.

(3) The load condition defined in paragraph (a)(2) of this section is also assumed to act on adjacent airframe structure, such as the wing and fuselage. This load condition is multiplied by a factor of 1.25 to obtain ultimate loads when the load is applied to the adjacent wing and fuselage supporting structure.

Issued in Renton, Washington, on January 14, 1999.

John J. Hickey,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service, ANM-100.

[FR Doc. 99-1352 Filed 1-20-99; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-NM-276-AD; Amendment 39-11004; AD 99-02-12]

RIN 2120-AA64

Airworthiness Directives; Fokker Model F.28 Mark 0070 and 0100 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to certain Fokker Model F.28 Mark 0070 and 0100 series airplanes,

that requires a one-time visual inspection to detect discrepancies of the components of the torque link apex joint and shimmy damper attachments of the main landing gear (MLG), and repair or replacement of any discrepant component with a new or serviceable component. This amendment is prompted by issuance of mandatory continuing airworthiness information by a foreign civil airworthiness authority. The actions specified by this AD are intended to prevent heavy vibration and possible damage to the components of the MLG, and consequent reduced controllability of the airplane during takeoff and landing.

DATES: Effective February 25, 1999.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of February 25, 1999.

ADDRESSES: The service information referenced in this AD may be obtained from Fokker Services B.V., Technical Support Department, P.O. Box 75047, 1117 ZN Schiphol Airport, the Netherlands. 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 Fokker Model F.28 Mark 0070 and 0100 series airplanes was published in the **Federal Register** on November 13, 1998 (63 FR 63423). That action proposed to require a one-time visual inspection to detect discrepancies of the components of the torque link apex joint and shimmy damper attachments of the main landing gear (MLG), and repair or replacement of any discrepant component with a new or serviceable component.

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

Two commenters state that they are not affected by the proposed rule and, therefore, have no technical comments regarding the proposed rule.