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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM322; Special Condition No. 25–333–SC]

Special Conditions: Airbus Model A380–800 Airplane, Transient Engine Failure Loads

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Airbus A380–800 airplane. This airplane will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. Some of these novel or unusual design features are associated with the high bypass engines used on the Model A380. For these design features, the applicable airworthiness regulations do not contain adequate or appropriate safety standards regarding transient engine failure loads. These proposed 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 the Airbus Model A380–800 airplane.

DATES: *Effective Date:* The effective date of these special conditions is October 6, 2006.

FOR FURTHER INFORMATION CONTACT: Holly Thorson, FAA, International Branch, ANM–116, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–1357; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Background

Airbus applied for FAA certification/validation of the provisionally-designated Model A3XX–100 in its letter AI/L 810.0223/98, dated August 12, 1998, to the FAA. Application for certification by the Joint Aviation Authorities (JAA) of Europe had been made on January 16, 1998, reference AI/L 810.0019/98. In its letter to the FAA, Airbus requested an extension to the 5-year period for type certification in accordance with 14 CFR 21.17(c).

The request was for an extension to a 7-year period, using the date of the initial application letter to the JAA as the reference date. The reason given by Airbus for the request for extension is related to the technical challenge, complexity, and the number of new and novel features on the airplane. On November 12, 1998, the Manager, Aircraft Engineering Division, AIR–100, granted Airbus' request for the 7-year period, based on the date of application to the JAA.

In its letter AI/LE–A 828.0040/99 Issue 3, dated July 20, 2001, Airbus stated that its target date for type certification of the Model A380–800 had been moved from May 2005, to January 2006, to match the delivery date of the first production airplane. In a subsequent letter (AI/L 810.0223/98 issue 3, dated January 27, 2006), Airbus stated that its target date for type certification is October 2, 2006. In accordance with 14 CFR 21.17(d)(2), Airbus chose a new application date of December 20, 1999, and requested that the 7-year certification period which had already been approved be continued. The FAA has reviewed the part 25 certification basis for the Model A380–800 airplane, and no changes are required based on the new application date.

The Model A380–800 airplane will be an all-new, four-engine jet transport airplane with a full-length double-deck, two-aisle cabin. The maximum takeoff weight will be 1.235 million pounds with a typical three-class layout of 555 passengers.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Airbus must show that the Model A380–800 airplane meets 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 do not contain adequate or appropriate safety standards for the Airbus A380–800 airplane because of novel or unusual design features, special conditions are prescribed under the provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Airbus Model A380–800 airplane 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. In addition, the FAA must issue a finding of regulatory adequacy pursuant to section 611 of Public Law 93–574, the ''Noise Control Act of 1972.''

Special conditions, as defined in 14 CFR 11.19, are issued in accordance with 14 CFR 11.38 and become part of the type certification basis in accordance with 14 CFR 21.17(a)(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, the special conditions would also apply to the other model under the provisions of 14 CFR 21.101.

Discussion of Novel or Unusual Design Features

The Model A380 will have very large high bypass ratio engines with 110 inch diameter bypass fans, representing the latest in a trend toward increasing engine size. Engines of this size were not envisioned when § 25.361—pertaining to loads imposed by engine seizure—was adopted in 1965. Worst case engine seizure events become increasingly more severe with increasing engine size because of the higher inertia of the rotating components.

Section 25.361(b)(1) requires that for turbine engine installations, the engine mounts and the supporting structures must be designed to withstand a ''limit engine torque load imposed by sudden engine stoppage due to malfunction or structural failure.'' Limit loads are expected to occur about once in the lifetime of any airplane. Section 25.305 requires that supporting structures be able to support limit loads without detrimental permanent deformation, meaning that the supporting structures

should remain serviceable after a limit load event.

Since the adoption of § 25.361(b)(1), the size, configuration, and failure modes of jet engines have changed considerably. Current engines are much larger and are designed with large bypass fans. In the event of a structural failure, these engines are capable of producing much higher transient loads on the engine mounts and supporting structures.

As a result, modern high bypass engines are subject to certain rare-but-severe engine seizure events. Service history shows that such events occur far less frequently than limit load events. Although it is important for the airplane to be able to support such rare loads safely without failure, it is unrealistic to expect that no permanent deformation will occur.

Given this situation, the Aviation Rulemaking Advisory Committee (ARAC) [1] has proposed a design standard for today's large engines. For the commonly-occurring deceleration events, the proposed standard requires engine mounts and structures to support maximum torques without detrimental permanent deformation. For the rare-but-severe engine seizure events (i.e., loss of any fan, compressor, or turbine blade), the proposed standard requires engine mounts and structures to support maximum torques without failure, but allows for some deformation in the structure.

The FAA concludes that modern large engines, including those on the Model A380, are novel and unusual compared to those envisioned when § 25.361(b)(1) was adopted and thus warrant special conditions. The special conditions contain design criteria, as recommended by the ARAC.

The ARAC proposal would revise the wording of § 25.361(b), including §§ 25.361(b)(1) and (b)(2), removing the language pertaining to structural failures and moving it to a separate requirement that discusses the reduced factors of safety that apply to these failures. The revised wording of § 25.361(b) would also include non-substantive changes recommended by ARAC to clarify the existing requirement. The FAA is using this ARAC text in these special conditions, because it clarifies the supplementary conditions for engine torque.

[1] Industry members of the ARAC group included Embraer, Dassault Aviation, Airbus, Gulfstream, Lockheed Martin, Boeing, Cessna, Bombardier, Raytheon, Rolls Royce, Pratt & Whitney, and General Electric. In addition to the FAA, aviation authorities included CAA-UK, Transport Canada, DGAC-France, CTA-Brazil, and CAA-Netherlands.

Discussion of Comments

Notice of Proposed Special Conditions No. 25–05–17–SC, pertaining to transient engine failure loads, was published in the **Federal Register** on August 9, 2005 (70 FR 46104). Comments were received from the Boeing Company and the Airline Pilots Association (ALPA).

Requested change 1: The Boeing Company recommends that the proposed special conditions be withdrawn, for the following reasons:

(1) The engines on the Model A380 are not novel or unusual design features, and

(2) The proposed special conditions would provide a level of safety greater than that established by the regulations, rather than an equivalent level as safety, as specified by § 21.16.

Specifically, Boeing states the following:

''These proposed Special Conditions address transient engine loads resulting from sudden engine stoppage, because of the large size of the engines being used on the Model A380. The FAA references a report submitted by the Aviation Rulemaking Advisory Committee (ARAC) that addresses design standards for large engines and contains suggested associated regulatory changes. The FAA has taken the ARAC-proposed regulations and has applied them, essentially verbatim, to the Model A380 as Special Conditions.

''We consider this 'general rulemaking by Special Conditions.' The engines on the Model A380 are not novel or unusual compared to other large engines used on other large transports.

''In addition, 14 CFR § 25.361 already contains engine torque standards. Section 21.16 enables the FAA to issue special conditions ''to establish a level of safety equivalent to that established in the regulations.'' It does not authorize the FAA to issue special conditions to upgrade a level of safety already in the regulations.

''In sum, we believe the FAA has failed to comply with two necessary conditions for the issuance of a Special Condition, and the proposal should be withdrawn.''

FAA response: The FAA does not agree with this comment. The regulation that specifies design criteria pertaining to engine torque effects resulting from sudden engine stoppage was developed in 1957 (as Civil Aviation Regulations (CAR) 4b.216(a)(4), Amendment 4b–6). In 1964 the regulation was recodified as 14 CFR 25.361. The design criteria were developed for turbojet and low by-pass ratio turbofan engines.

The new large high-bypass ratio turbofan engines being developed for the Model A380 have very large fans that produce failure modes and torque loads that were not envisioned when the regulatory design criteria were developed. The FAA has determined that this new generation of large high-bypass turbofan engines is sufficiently different from engines envisioned in 1957 as to justify issuance of special conditions to establish appropriate design standards. The design standards in these special conditions provide a level of safety for large high by-pass turbofan engines equivalent to that which the current regulations provide for turbojet or low-bypass ratio turbofan engines.

The fact that the special conditions consist of draft regulations proposed by ARAC is not relevant to their suitability or appropriateness in this circumstance. The FAA considers the regulations proposed by ARAC to be acceptable for addressing the effects of sudden engine torque for large high-bypass turbofan engines and has issued similar special conditions for other airplane models. Section 21.16 requires the Administrator to issue special conditions in this circumstance and does not restrict her from using language contained in the ARAC-proposed regulations.

Requested change 2: The Airline Pilots Association (ALPA) supports the intent of the special conditions, as proposed, but offers the following comment:

''The subject special condition does not address potentially serious aerodynamic effects resulting from a total engine failure and seizure. Engine seizure could introduce engine support structure deformation that may ultimately affect the aerodynamics of the airframe. The special conditions should require some sort of analysis to ensure that any drag changes due to a seized engine will not adversely affect the support structures of the aerodynamics such that safe operation of the aircraft is degraded.''

FAA response: The FAA agrees. Although not specifically stated, it was the intent of the proposed special condition that the airplane be capable of continued safe flight after the load conditions specified in b.1. Accordingly, the FAA has revised the final special conditions to clarify this point.

Applicability

As discussed above, these special conditions are applicable to the Airbus A380–800 airplane. Should Airbus apply at a later date for a change to the type certificate to include another model incorporating the same novel or

unusual design features, these special conditions would apply to that model as well under the provisions of § 21.101.

Conclusion

This action affects only certain novel or unusual design features of the Airbus A380–800 airplane. It is not a rule of general applicability.

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 the Airbus A380–800 airplane.

a. In lieu of compliance with § 25.361(b), the following special condition applies:

For turbine engine installations, the engine mounts, pylons, and adjacent supporting airframe structure must be designed to withstand 1 g level flight loads acting simultaneously with the maximum limit torque loads imposed by each of the following:

1. Sudden engine deceleration due to a malfunction which could result in a temporary loss of power or thrust; and

2. The maximum acceleration of the engine.

b. In addition to the requirements of 14 CFR part 25, the following special condition applies:

1. For engine supporting structure, an ultimate loading condition must be considered that combines 1 g flight loads with the transient dynamic loads resulting from:

(a) The loss of any fan, compressor, or turbine blade; and

(b) Separately, where applicable to a specific engine design, any other engine structural failure that results in higher loads.

2. The ultimate loads developed from the conditions specified in paragraph b.1. above are to be:

(a) Multiplied by a factor of 1.0 when applied to engine mounts and pylons; and

(b) Multiplied by a factor of 1.25 when applied to adjacent supporting airframe structure.

3. The airplane must be capable of continued safe flight considering the aerodynamic effects on controllability due to any permanent deformation that results form the conditions specified in b.1.

Issued in Renton, Washington, on October 6, 2006.

Kalene C. Yanamura,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E6–17534 Filed 10–19–06; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Docket No. FAA–2006–25069; Airspace Docket No. 06–AWP–9]

RIN 2120–AA66

Modification of Class E Airspace; Honolulu International Airport, HI

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action modifies the Class E airspace area at Honolulu International Airport, HI. The establishment of an Area Navigation (RNAV) Required Navigation Performance (RNP) Instrument Approach Procedure (IAP) to Runway (RWY) 08L and 26L to Honolulu International Airport, Honolulu, HI has made this action necessary. Additional controlled airspace extending upward from 700 feet or more above the surface of the earth is needed to contain aircraft executing this RNAV (RNP) IAP to RWY 08L and 26L to Honolulu International Airport. The intended effect of this action is to provide adequate controlled airspace for Instrument Flight Rules operations at Honolulu International Airport, Honolulu, HI.

DATES: *Effective Date:* 0901 UTC January 18, 2007. The Director of the Federal Register approves this incorporation by reference action under title 1, Code of Federal Regulations, part 51, subject to the annual revision of FAA Order 7400.9 and publication of conforming amendments.

FOR FURTHER INFORMATION CONTACT: The Office of the Regional Western Terminal Operations, Federal Aviation Administration, at 15000 Aviation Boulevard, Lawndale, California 90261, telephone (310) 725–6502.

SUPPLEMENTARY INFORMATION:

History

On August 2, 2006, the FAA proposed to amend 14 CFR part 71 by modifying the Class E airspace area at Honolulu International Airport (06 FR 43680). Additional controlled airspace extending upward from 700 feet or move above the surface is needed to contain aircraft executing the RNAV (RNP) IAP RWY 08L and 26L to Honolulu International Airport. This action will provide adequate controlled airspace for aircraft executing the RNAV (RNP) IAP RWY 08L and 26L to Honolulu International Airport, Honolulu, HI.

Interested parties were invited to participate in this rulemaking proceeding by submitting written comments on the proposal to the FAA. No comments to the proposal were received. Class E airspace designations for airspace extending from 700 feet or more above the surface of the earth are published in paragraph 6005 of FAA Order 7400.9P, dated September 1, 2006, and effective September 15, 2006, which is incorporated by reference in 14 CFR 71.1. The Class E airspace designation listed in this document will be published subsequently in the Order.

The Rule

This amendment to 14 CFR part 71 modifies the Class E airspace area at Honolulu International Airport, HI. The establishment of a RNAV (RNP) IAP RWY 08L and 26L to Honolulu International Airport has made this action necessary. The effect of this action will provide adequate airspace executing the RNAV (RNP) IAP RWY 08L and 26L to Honolulu International Airport, Honolulu, HI.

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current. Therefore, this regulation—(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) does not warrant preparation of a Regulation Evaluation as the anticipated impact is so minimal. Since this is a routine matter that will only affect air traffic procedures and air navigation, it is certified that this rule will not have a significant economic impact on a substantial number of a small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 71

Airspace, Incorporation by reference, Navigation (air).

Adoption of the Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR part 71 as follows: