Policy Statement

Subject: Certification of Cargo Projects  Date: 08/11/17  Policy No: PS-ANM-25-32

Initiated By:
AIR-675

Summary

This policy clarifies the applicable regulatory requirements, operating limitations, necessary compliance data, and certification approval process for design approvals related to the carriage of cargo on transport category airplanes. This policy reiterates the responsibility that applicants have regarding weight and balance manuals (WBMs) when applying for design approval for any portion of a cargo loading system. Misunderstanding or incorrect application of these requirements and processes has led to non-standardization in the way the Federal Aviation Administration (FAA) has approved cargo-related designs, which has contributed to operator non-compliance with title 14, Code of Federal Regulations (14 CFR) part 91 operating rules.

Definition of Key Terms

In this policy, the terms “must,” “should,” and “recommend” have specific meanings:

- The term “must” refers to a regulatory requirement that is mandatory for design approval. The functional impact of the term “must” is that the requirement has to be met to achieve design approval.

- The term “should” refers to instructions for a particular acceptable means of compliance (MOC). The functional impact of the term “should” is that any alternative MOC has to be approved by issue paper.

- The term “recommendation” refers to a recommended practice that is optional. There is no functional impact of the term “recommend” because it is optional.

In addition, the following terms used in this policy statement are defined as follows:

- **Airplane Flight Manual (AFM)**. An FAA-approved document that contains information (operating limitations, operating procedures, performance information, etc.) necessary to operate the airplane at the level of safety established by the airplane’s certification basis per 14 CFR 25.1581 (see Advisory Circular (AC) 25.1581-1).
• **AFM Supplement.** Information that supersedes, or is in addition to, the basic AFM resulting from the issuance of a supplemental type certificate (STC) or from approved changes to AFM limitations, procedures, or performance information without an STC (see AC 25.1581-1).

• **Weight and Balance Manual (WBM).** A separate document from the AFM, that contains operating limitations, including weight and loading distribution information, that are not included in the AFM but must be incorporated by reference in the limitations section of the AFM per § 25.1583(c) and approved by the FAA.

• **WBM Supplement.** A document that is separate from the AFM or AFM supplement, but is incorporated by reference in the AFM or AFM supplement in the limitations section.

• **Special Cargo.** See FAA AC 120-85, *Air Cargo Operations*, for the definition of special cargo.

**Current Regulatory and Advisory Material**

The regulations applicable to the subject are:

- 14 CFR § 25.25, *Weight limits*.
- 14 CFR § 25.27, *Center of gravity limits*.
- 14 CFR § 91.9, *Civil aircraft flight manual, marking, and placard requirements*.
- AC 120-85, *Air Cargo Operations*.
- FAA Order 8110.4C, *Type Certification*.

**Relevant Past Practice**

In accordance with 14 CFR 21.5, each design approval holder (holder of a type certificate, amended type certificate, or supplemental type certificate) must make an AFM available to the owner at the time of delivery of an airplane. The AFM must contain operating limitations and information required to be furnished in an AFM by the applicable regulations under which the airplane was type certificated. This information includes all the information required by § 25.1583. Section 25.1581(b) delineates the information that must be FAA-approved and clearly
distinguished as such in the AFM. Section 25.1583(c) requires weight and balance information, including loading instructions, to be included as operating limitations in the AFM. Operating limitations required by § 25.1583 must be FAA-approved and are part of the type certificate. Changes to the operating limitations can only be made by a change to the type certificate, via an amended type certificate, supplemental type certificate, or amended supplemental type certificate.

Following the 2013 National Air Cargo accident involving a Boeing 747-400 at Bagram Airfield, Afghanistan, the FAA began reviewing airline cargo procedures for airlines operating in 14 CFR part 121 operations. This review included looking more closely at the design approval holder’s WBMs in use by cargo operators. The FAA found multiple instances of erroneous or missing loading information in the WBMs. The following are examples of FAA findings:

1. Unauthorized approvals of changes to the airplane operating limitations in the WBM made by FAA designated engineering representatives (DER).
2. DER approvals beyond their authorizations; e.g., DER approval of a modification to a Technical Standard Order (TSO); DER approval of deviations to lock or loading configurations that do not conform to U.S. Department of Defense National Aerospace Standards (NAS) NAS3610 or SAE Aerospace Standard (AS) AS36100.
3. Engineering errors in the type certificate WBMs and supplemental type certificate WBM supplements such as undefined or non-compliant loading configurations that exceed the airplane design capabilities resulting in potentially unsafe operating conditions.
4. STCs issued for cargo loading systems (CLSs) and components missing the associated airplane operating limitations (WBM supplement) that allow usage of the CLS or components.
5. Changes to cargo loading allowances (e.g. operating limitations) made via field approval (e.g. no change to the type design).
6. Supplemental type certificates issued for passenger to cargo conversions that do not define or maintain configuration control of the CLS associated with the STC type design data. For example, some cargo conversion STC WBMs allow certain CLSs to be installed by a separate STC, but the cargo conversion STC type design data does not address all configurations allowed by the CLS STC or amended CLS STC.

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Section 21.5 requires that the type certificate holder (including amended or supplemental type certificates) make an AFM available to the owner at the time of delivery of an airplane. Section 21.41 states that the type certificate includes operating limitations. Section 25.1581 states that the AFM (or AFM supplement) must contain FAA-approved information, including the operating limitations required by § 25.1583. Per § 25.1583, operating limitations for the airplane must include “loading instructions necessary to ensure loading of the airplane within the weight and center of gravity limits, and to maintain the loading within these limits in flight.” Therefore, design approvals (type certificates, supplemental type certificates, amended type certificates) related to the carriage of cargo on transport category airplanes must include an FAA-approved
AFM or AFM supplement that incorporates the required loading instructions. These loading instructions are typically contained in an FAA approved WBM (or WBM supplement) that is incorporated by reference in the AFM or AFM supplement. Refer to FAA Order 8110.4C for guidance on methods for obtaining FAA approval of AFMs.

1. Loading instructions are required by § 25.1583(c) and must be FAA-approved. These loading instructions typically include the weight and center of gravity diagrams, local limits (running load, area load, lateral load, etc.) in the WBM, and the types of payloads allowed in the cargo compartment. These payloads include:

   • bulk compartments;
   • specific unit load devices (ULDs) allowed for use with the cargo loading system; or
   • special cargo provisions including restraint locations, methods, and allowable load limits at each restraint location.

2. Section 25.1583(c) requires the AFM to include weight and balance information, including loading instructions, as operating limitations. Operating limitations required by § 25.1583 must be FAA-approved and are part of the type certificate. Changes to the loading instructions required by § 25.1583 are a change to the type certificate, and must be made via an amended type certificate, STC, or amended STC.

3. The WBM (or WBM supplement) for any design change related to cargo loading should be specific enough that, when followed, it provides no possibility for an airplane to be loaded past its certified capability as demonstrated by the airplane type certificate holder. Applicants for a type design change should pay close attention to the cargo loading limits in the original WBM provided by the airplane type certificate holder. Those limits must not be exceeded without thorough substantiation of the design change and the affected baseline airplane structure.

4. In the case that multiple design changes are applied on one airplane, the STC (or amended STC) for the cargo loading system should identify the specific STC(s) that are compatible with the cargo loading system and allowed by the FAA-approved loading instructions in the WBM (or WBM supplement).

5. Designees (e.g., FAA delegated organization unit members, designated engineering representatives, designated airworthiness representatives, airworthiness representatives, or designees from international authorities) must ensure that any change to airplane operating limitations, including loading instructions per § 25.1583, is accomplished via an amended type certificate, STC, or amended STC.

6. Aircraft certification offices must ensure that each design approval related to the carriage of cargo on a transport category airplane has an AFM or AFM supplement that includes operating limitations per § 25.1583. The operating limitations for securing cargo should be provided in the form of a WBM or WBM supplement incorporated by reference in the AFM or AFM supplement.
**Effect of Policy**

The general policy stated in this document does not constitute a new regulation. This policy restates existing FAA regulations and orders. Agency employees and their designees and delegations must not depart from this policy statement without appropriate justification and concurrence from the FAA management that issued this policy statement. The authority to deviate from this policy statement is delegated to the Transport Standards Staff manager.

**Implementation**

This policy reiterates the requirements applicable to WBM s for cargo loading systems and must be applied to all type certificate, amended type certificate, supplemental type certificate, and amended supplemental type certificate programs for cargo loading systems.

**Conclusion**

The FAA concludes that it is necessary to reiterate the requirements for design approvals related to the carriage of cargo on transport category airplanes. This policy statement clarifies the need for applicants seeking such design approvals to establish operating limitations, in the form of a WBM or WBM supplement, incorporated by reference in the AFM or AFM supplement as type design data. This guidance provides support for air carrier compliance with air carrier operational rules.

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