Advisory Circular (AC)

Airworthiness Standards For The Design Of Aircraft Floats

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this Advisory Circular (AC) is to summarise the applicable airworthiness standards for the design of metallic aircraft floats that are used as a basis for the issuance of an Appliance Type Certificate. Also, guidance is provided for use of non-metallic materials in float construction.

1.2 Guidance Applicability

This document is applicable to all Transport Canada personnel, delegates and industry.

1.3 Description of Changes

This document, formerly AMA No. 500/11, is reissued as an AC. With the exception of minor editorial changes and updated references, the content is unaltered.

1.4 Termination

This document does not have a terminating action. It will however, be reviewed periodically for suitability of content.

2.0 REFERENCES

2.1 Reference Documents

It is intended that the following reference materials be used in conjunction with this document:

(a) Chapter 523 of the Airworthiness Manual (AWM) — Normal, Utility, Aerobatic and Commuter Category Aeroplanes;
(b) Chapter 525 of the AWM — Transport Category Aeroplanes;
(c) Chapter 527 of the AWM — Normal Category Rotorcraft;
(d) Chapter 529 of the AWM — Transport Category Rotorcraft;
(e) Chapter 537 of the AWM — Appliances;
(f) Advisory Circular (AC) 500-009 — Composite Aircraft Structures;
(g) Federal Aviation Administration Technical Standard Order (FAA TSO)-C27 and Amendment 2 — Twin Seaplane Floats;
(h) National Aircraft Standards Specification (NAS) 807 — Specification-Twin Seaplane Floats;
(i) U.S. Military Handbook (MIL-HDBK)-5J — Metallic Materials and Elements for Aerospace Vehicle Structures Handbook; and

2.2 Cancelled Document

As of the effective date of this document, AMA No. 500/11 dated 2 February 1998 is cancelled.

3.0 BACKGROUND

Floats can be approved as part of the aircraft type design or separately as an appliance for installation on aircraft. If the floats are part of the aircraft type design, the aircraft manufacturer should submit the pertinent float drawings and include them on the aircraft drawing list. Floats intended for approval as an appliance shall comply with established strength and performance requirements. To obtain approval of the installation the floats shall also meet the applicable requirements specified in the basis of certification of the aircraft type for which they are intended.
4.0 AIRWORTHINESS STANDARDS

Airworthiness standards for the design of aircraft floats are outlined below:

(a) **Aeroplane Floats**

Chapter 537 of the AWM incorporates by reference FAA TSO-C27, *Twin Seaplane Floats*, as the minimum airworthiness standard for aeroplane floats.

FAA TSO-C27 requires, in part, that seaplane floats comply with the strength and performance requirements set forth in Sections 3 and 4 of NAS 807, *Specification-Twin Seaplane Floats*, with the exceptions noted in the FAA TSO, section 3 addresses material and workmanship qualities, and section 4 provides the details of strength and performance requirements. Dependent on the aircraft basis of certification, additional requirements for floats are those found in Chapters 523 and 525 of the AWM.

For normal, utility or aerobatic aeroplanes approved to the standards of Chapter 523 of the AWM, it should be noted that compliance with the requirements of NAS 807 may not satisfy the buoyancy requirements of section 523.751. This section requires reasonable assurance that the aeroplane will stay afloat without capsizing, if any two compartments of any main float are flooded. NAS 807 does not have this requirement.

(b) **Helicopter Floats**

The minimum airworthiness standards for helicopter floats are those provided in Chapters 527 and 529 of the AWM. However, due to differing interpretations that have been applied to these standards in previous programs, the issue of helicopter floats is currently under review by the FAA, Transport Canada and industry. It is anticipated that this review activity will result in the issuance of guidance material (FAA Advisory Circular) intended to establish a uniform interpretation of the requirements and the expected level of compliance. Pending the outcome of such review, float designers may contact the Transport Canada Aircraft Certification office for information and guidance.

(c) **Auxiliary Floats**

In addition to complying with the applicable standard for the main floats or hull, auxiliary floats must be in compliance with the requirements of the basis of certification of the aircraft type on which the floats will be installed. This would apply particularly to those requirements pertaining to ground loads, landing gear and related systems. The float designer should contact the Transport Canada Aircraft Certification office for additional technical conditions that may be required for a specific float design.

5.0 DESIGN DATA

The following outlines the material allowables in the design of aircraft floats:

(a) For metallic structures, the design allowables contained in MIL-HDBK-5J, *Metallic Materials and Elements for Aerospace Vehicle Structures Handbook* are acceptable.

(b) For polymer matrix composite structures, the data and guidelines of MIL-HDBK-17F Volume 1 to 5, *Composite Materials Handbook*, provide an acceptable methodology for development or derivation of design allowables. Materials must be shown to meet a minimum strength specification ensuring that minimum strength allowables are met, regardless of batch-to-batch or process variability.

(c) AC 500-009, *Composite Aircraft Structures*, provides guidance to applicants who wish to submit compliance documentation for a structure made from composite materials. Although the AC does not make specific reference to floats or to NAS 807 specifications, it may be considered to be equally applicable in cases where it is required to show compliance with NAS 807 and FAA TSO-C27 standards.
6.0 HEADQUARTERS CONTACT

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