

EASA	NOTIFICATION OF A PROPOSAL TO ISSUE A CERTIFICATION MEMORANDUM
	<p>EASA Proposed CM No.: EASA Proposed CM – S – 002 Issue: 01 Issue Date: 27th of August 2013 Issued by: Structures section Approved by: Head of Certification Experts Department Regulatory Requirement(s): CS 25.561 (c)(2)</p>

In accordance with the EASA Certification Memorandum procedural guideline, the European Aviation Safety Agency proposes to issue an EASA Certification Memorandum (CM) on the subject identified below.

All interested persons may send their comments, referencing the EASA Proposed CM Number above, to the e-mail address specified in the "Remarks" section, prior to the indicated closing date for consultation.

EASA Certification Memoranda clarify the European Aviation Safety Agency's general course of action on specific certification items. They are intended to provide guidance on a particular subject and, as non-binding material, may provide complementary information and guidance for compliance demonstration with current standards. Certification Memoranda are provided for information purposes only and must not be misconstrued as formally adopted Acceptable Means of Compliance (AMC) or as Guidance Material (GM). Certification Memoranda are not intended to introduce new certification requirements or to modify existing certification requirements and do not constitute any legal obligation.

EASA Certification Memoranda are living documents into which either additional criteria or additional issues can be incorporated as soon as a need is identified by EASA.

Subject

**Application of CS 25.561 (c)(2) 1-33 'Wear and Tear' Factor
– Frequent Removal of Interior Structures**

Log of Issues

Issue	Issue date	Change description
01	27.08.2013	First issue.

Table of Contents

1. INTRODUCTION	4
1.1. Purpose and Scope	4
1.2. References	4
1.3. Abbreviations	4
1.4. Definitions.....	4
2. BACKGROUND	5
2.1. Existing Requirements and AMC	5
2.1.1. CS 25.561 (c)(2).....	5
2.1.2. AMC 25.561 (b)(3) Commercial Accommodation Equipment	6
3. EASA CERTIFICATION POLICY	6
3.1. EASA Policy	6
3.2. Who this Certification Memorandum Affects	7
4. REMARKS	7

1. INTRODUCTION

1.1. PURPOSE AND SCOPE

This Certification Memorandum provides guidance on the application of the 1.33 'Wear and Tear' factor applied to inertia forces for interior structure/item of mass attachment fittings (including seat rails), as required by CS 25.561 (c)(2) for large items of mass, e.g. galleys, closets, lavatories, class dividers, etc. which may be frequently moved and which, if they became loose, could directly, or indirectly, threaten occupant safety.

This Certification Memorandum does not attempt to address other structural items which may attract the use of such a factor, e.g. engine mounts, or latches, or attachments of seats, berths, and safety belts as referenced in CS 25.785, 25.787, 25.789.

1.2. REFERENCES

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

Reference	Title	Code	Issue	Date
CS 25.561 (c)(2)	Emergency Landing Conditions	CS-25	---	---

1.3. ABBREVIATIONS

The following abbreviations are used in this Certification Memorandum:

Abbreviation	Meaning
AMC	A cceptable M eans of C ompliance
CS	C ertification S pecification
EASA	E uropean A viation S afety A gency
FAR	F ederal A viation R egulation
g	g ram
lb	p ound
PBE	P rotective B reathing E quipment
STC	S upplemental T ype C ertificate
TC	T ype C ertificate

1.4. DEFINITIONS

The following definitions are used in this Certification Memorandum:

Definition	Meaning
---	---

2. BACKGROUND

Recent Certification/Validation projects have indicated a need for further guidance and harmonisation regarding the application of the 1.33 'Wear and Tear' factor to interior structure/item of mass attachment fittings subjected to frequent removal. Increasing numbers of fuselage interiors are being designed to ease the tasks of completing cabin re-fits and configuration changes and removal of interior structure for maintenance access to other parts of the aircraft, e.g. zoned/modularised/flexible/adaptable areas. There has also been concern relating to the lack of standardisation of compliance with CS 25.561(c)(2), in particular for STCs.

Designing to simplify cabin changes and removals may also result in more frequent removal taking place than first envisaged and an increased potential for wear and tear and even damage.

Although the definition of 'frequent', in this context, and correlation between ease of change, frequency of change, and occurrence of wear (and its significance) may be difficult to establish and may require 'engineering judgement', EASA considers increased occurrence of damage to be a reasonable expectation in such situations. Until convincing evidence is provided to the contrary, EASA considers that it is necessary to address this potential increase in wear and associated damage by ensuring correct application of the 1.33 factor.

Frequent changes, particularly in an operating environment, are likely to be associated with tight timescales, limited inspection equipment availability, and limited opportunities to access and thoroughly inspect the attachments.

The number of changes, i.e. the number of times a specific item is removed/replaced, and also the accumulation of design changes, during an aircraft life may be difficult to track for regulatory purposes and may well occur without original manufacturer involvement.

CS 25.561 (c)(2) provides 'quick change' interiors as an example of when attachment fittings would attract the 1.33 'Wear and Tear' factor. This is perhaps one of the more obvious examples of the designs requiring the 1.33 factor and was added to specifically address some modifications that allowed frequent daily changes between cargo and passenger configurations by using palletised rows of seats. It does not address the full scope of the intended application of the 1.33 factor, e.g. as indicated in existing AMC 25.561 (b)(3), which supports a much broader application, referring also to 'commercial accommodation equipment'.

The above concerns relating to evolving design philosophy, the subsequent potential for more frequent changes, and the associated increased potential for damage, have driven the need for further guidance to support and clarify existing requirements regarding the applicability of the 1.33 'Wear and Tear' factor to frequently changed interior structure/item of mass attachment fittings.

2.1. EXISTING REQUIREMENTS AND AMC

2.1.1. CS 25.561 (c)(2)

Existing requirement **CS 25.561 (c)(2)**, and related AMC, identifies the need for the 1.33 factor to be applied to interior structure attachments likely to be subject to 'severe wear and tear'.

"CS 25.561 (c) *For equipment, cargo in the passenger compartments and any other large masses, the following apply:...*

- (1) *These items must be positioned so that if they break loose they will be unlikely to:*
 - (i) *Cause direct injury to occupants;*
 - (ii) *Penetrate fuel tanks or lines or cause fire or explosion hazard by damage to adjacent systems; or*

- (iii) *Nullify any of the escape facilities provided for use after an emergency landing.*
- (2) *When such positioning is not practical (e.g. fuselage mounted engines or auxiliary power units) each such item of mass must be restrained under all loads up to those specified in subparagraph (b)(3) of this paragraph. **The local attachments for these items should be designed to withstand 1.33 times the specified loads if these items are subject to severe wear and tear through frequent removal (e.g., quick change interior items).***

2.1.2. AMC 25.561 (b)(3) Commercial Accommodation Equipment

*"Commercial accommodation equipment complying only with FAR 25.561 pre-Amendment 25-91 need additional substantiation by analysis, tests or combination thereof to cover the 1.33 factor for their attachments as specified in **CS 25.561 (c).**"*

3. EASA CERTIFICATION POLICY

3.1. EASA POLICY

The 1.33 'Wear and Tear' factor, as identified in CS 25.561 (c)(2) and supporting AMC, is intended to be applied to interior structure/item of mass attachment fittings including, but not limited to, structure:

- designed for 'quick change' (per the original example provided in the requirements), which makes possible rapid changes, e.g., frequent overnight changes, seasonal changes, etc., between cargo and passenger configurations using palletised seats, cargo nets, etc. Such changes are of particular concern in the post TC modification market for existing airframes, when particular care is also required regarding the determination of the original design assumptions at the intended modification attachment locations;
- which is zoned/modularised/flexible/adaptable (probably more recent TC designs) and designed by the manufacturer to include quick access/quick release features such that change is possible during very minor inputs, e.g., those taking less than a few days or during operation, etc.;
- likely to be changed/moved at a frequency equal to, or greater than the frequency of typical local seat changes/movements, e.g., dividers and partitions moved to allow regular change between business and economy configurations when in service and the seating attachment configuration remains unchanged;
- designed to allow frequent access to other parts of the aircraft for inspection and maintenance;
- likely to be removed locally on an 'ad hoc' basis, e.g., overhead bins with quick release pins. This is particularly important if such removal is likely to occur uncontrolled/unrecorded due to ease of removal providing an attractive practical alternative solution to an approved access route.

Note: All interior structure and item of mass removals should be supported by thorough inspection, as appropriate to the design philosophy, of the attachments. This should include appropriate guidance, e.g., allowable damage limits etc., in supporting maintenance documentation. Particular attention should be paid when using existing fittings and seat track for a new interior.

EASA acknowledges that the above examples are not all inclusive and that some 'engineering judgement' is still required regarding the extent of application. If in doubt, the applicant should discuss the matter with the Agency early in the design process.

Note: The 1.33 factor is considered appropriate for all attachments of items of mass > 0,45 kg (1lb) likely to experience frequent removal (> 0,15 kg (1/3lb) if attached to a seat) and all safety equipment mountings (PBE, Fire Extinguishers, Oxygen Bottles, etc.).

3.2. WHO THIS CERTIFICATION MEMORANDUM AFFECTS

This Certification Memorandum affects applicants who need to show compliance with CS-25 Emergency Landing Conditions.

4. REMARKS

1. This EASA Proposed Certification Memorandum will be closed for public consultation on the **10th of October 2013**. Comments received after the indicated closing date for consultation might not be taken into account.
2. Comments regarding this EASA Proposed Certification Memorandum should be referred to the Certification Policy and Planning Department, Certification Directorate, EASA. E-mail CM@easa.europa.eu or fax +49 (0)221 89990 4459.
3. For any question concerning the technical content of this EASA Proposed Certification Memorandum, please contact:

Name, First Name: Waite, Simon

Function: Structures Expert

Phone: +49 (0)221 89990 4042

Facsimile: +49 (0)221 89990 4542

E-mail: simon.waite@easa.europa.eu