Certification Memorandum

Regulatory Significant Standards Differences for pair CS-25 Amendment 12 vs 14 CFR Part 25 Amendment 1 through 136

EASA CM No.: CM-CS-25-001 Issue 01 issued 19 August 2015

Regulatory requirement(s): **CS-25,**
Technical Implementation Procedures for Airworthiness and Environmental Certification between the Federal Aviation Administration of the United States of America and the European Aviation Safety Agency of the European Union

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Log of issues

Issue	Issue date	Change description
01	19.08.2015	First issue.

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1. Introduction

1.1. Purpose and scope

When validating US certified aircraft types or changes to the type design, the regulatory differences are to be taken into account. The Technical Implementation Procedures for Airworthiness and Environmental Certification between the Federal Aviation Administration of the United States of America and the European Aviation Safety Agency of the European Union require both parties to provide lists, for various amendment pairs, of Standards Differences.

This Certification Memorandum at issue 01 provides the list of Significant Standards Differences (SSDs) for the amendment pair CS-25 Amendment 12 and the corresponding 14 CFR Part 25 Amendment 1 through 136.

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	Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes CS-25	CS-25	Amdt. 12	13/07/2012
---	Technical Implementation Procedures for Airworthiness and Environmental Certification between the Federal Aviation Administration of the United States of America and the European Aviation Safety Agency of the European Union	---	Rev. 2	22/10/2012

1.3. Abbreviations

AMC	Acceptable Means of Compliance
CA	Certification Authority
CM	Certification Memorandum
SSD	Significant Standards Differences
VA	Validating Authority

1.4. Definitions

The definitions required in this Certification Memorandum are provided in the Appendix 1.

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2. Background

The Agency and the FAA have under the frame of the USA/EU Bilateral Agreement and its Technical Implementation Procedures established the Type Validation & Post Type Validation Principles Agreement to guide the type certification of each other's products. The Type Validation Principles require that the Validating Authority publishes and periodically updates its listings of Regulatory Differences for current amendment pairs.

SSDs are part of the Regulatory Differences which need to be identified by each authority and reviewed during the type validations.

3. EASA Certification Policy

3.1. EASA Policy

The list of EASA SSDs for the amendments pair CS-25 Amendment 12 and 14 CFR Part 25 Amendment 1 through 136 is provided in the Appendix 1 to this Certification Memorandum.

3.2. Who this Certification Memorandum Affects

US-applicants for EASA large aeroplane Type Certificate or US-applicants for changes to the EASA Type Certificate (where applicable).

4. Remarks

1. Suggestions for amendment(s) to this EASA Certification Memorandum should be referred to the Certification Policy and Safety Information Department, Certification Directorate, EASA. E-mail CM@easa.europa.eu or fax +49 (0)221 89990 4459.
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Appendix 1

EASA Significant Standards Differences - Amendment Pair: CS-25 Amendment 12, 14 CFR Part 25 Amendment 1 through Amendment 136

General Comments and Assumptions:

This following list of SSDs which require direct CS-25 compliance is based on the CS-25/14 CFR Part 25 Amendment pair noted in the header.

This SSDs list includes only specifications where compliance with the FAR minimum standard would not be sufficient to comply with the EASA CS-25. (NOTE: The SSDs list is identified as the "EASA-SSDs" list to clarify that it is only intended for EASA validations of FAA products).

The definition of SSD from the "Technical Implementation Procedures for Airworthiness and Environmental Certification between the Federal Aviation Administration of the United States of America and the European Aviation Safety Agency of the European Union," Revision 2 dated 22 October 2012, is repeated below:

"Significant standards difference (SSD)" means a VA airworthiness standard that has no CA equivalent, which results in a difference that may require type design changes, approved manual changes or the imposition of operational limitations to meet the VA standards. The type design or operation approved by the VA could then differ from the design and/or operation approved by the CA.

Differences concerning CS-25 Subpart J (Auxiliary Power Unit Installations) are not reflected in this list and will need to be addressed separately during validations.

Note:

The EASA SSDs list from this Appendix is based on the TIP rev. 2 SSD definition. Any future EASA SSDs lists for other CS-25/ 14 CFR Part 25 Amdt. pairs, will need to consider the updated SSD definition. It should be noted that at TIP rev. 3 (dated 23 April 2013), the SSD definition was amended.

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
25.020	(b)	Require Operational Evaluation	No equivalent FAA requirement for CS 25.020(b).
25.302	N/A	Interactions of Systems and Structures	No equivalent requirement in 14 CFR Part 25.
25.307	(a)	Proof of Structure	The wording of 14 CFR Part 25 is different from CS-25 and this has resulted in different interpretations on the need for and the extent of static strength testing, including the load level to be achieved."
25.331	(c)	Manoeuvring pitching conditions	CS 25.331(c)(2) requires a (stretched) sinusoidal cockpit pitch control input to be considered, whereas 14 CFR Part 25 requires certain minimum pitching accelerations to be considered. CS-25 requires consideration of systems effects.
25.341	(b)	Continuous Turbulence	The turbulence intensities in CS-25 are different from the ones in 14 CFR Part 25 and potentially more stringent. Mission Analysis is no longer allowed in CS-25 (only Design Envelope). Non-linearities are explicitly addressed in CS-25.
25.341	(c)	Supplementary gust conditions for wing mounted engines	CS 25.0341 (c) has no equivalent 14 CFR Part 25 requirement.
25.343	(b)	Structural reserve fuel	By reference to CS 25.341(b)
25.345	(c)	High lift devices - En route	By reference to CS 25.341(b)
25.361	all	Engine and auxiliary power unit torque	CS-25 requires additional analysis in support of the compliance demonstration.
25.362	all	Engine failure loads	No equivalent requirement in 14 CFR Part 25.
25.371	N/A	Gyroscopic Loads	By reference to CS 25.341(b)(c).
25.373	all	Speed control device	By reference to CS 25.341(b).
25.391	all	Control surface loads general	By reference to CS 25.341(b).

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
25.415	(a)	Control system limit loads	CS-25 requirement is different from 14 CFR Part 25. Additionally analysis is required by CS-25.
	(b)	Control system, surface loads and hinge moments	
	(c)	Hinge moment factor	
	(d)	Limit loads due to ground gusts	No equivalent requirement in 14 CFR Part 25.
	(e)	Transient stresses	
	(f)	Control locks engaged	
	(g)	Taxying with control locks disengaged	
25.621	a	Casting Factors – General	Compared to 14 CFR Part 25, CS-25 defines different (levels of) casting factors, and associated inspection methods and area to be inspected. CS-25 provides criteria for use of a casting factor of 1.0.
	c	Critical castings	
	d	Non-critical castings	
25.629	(b)	Aeroelastic stability envelopes	25.629(b)(2)(iii) & (b)(3) have no 14 CFR Part 25 equivalent. CS-25 states that for failure conditions in those systems covered by CS 25.302, the margins defined in Appendix K apply. Note: 14 CFR Part 25 addresses failure condition in those systems under 14 CFR 25.629(b)(2). Depending on the probability of the failure condition, the CS-25 required flutter margin may be higher.
25.631	N/A	Bird strike damage	Although it is EASA understanding that compliance with the bird strike requirement could be equivalent when considering all related requirements including 14 CFR 25.631, 25. 571, 25.1309 and in particular the associated advisory material, this item is retained as an SSD based on the differences at the requirements' level only.
25.683	(b)	Under limit manoeuvre loads	No equivalent requirement in 14 CFR Part 25.

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
	(c)	No hazard from interference	
25.703	(a)	Aural configuration warning	CS-25 is more stringent than the 14 CFR 25. CS-25 requires the parking brake unreleased to be part of the Take-off warning config., where the FAA has no equivalent.
	(b)	Aural warning to continue until	CS-25 provides additional requirements regarding TO warning silencing.
25.721	all	Landing Gear	CS-25 is more extensive and stringent than 14 CFR Part 25 in its applicability (seating configuration) and conditions (MLW @ 5fps, landing gear side load conditions, pylon overload) to be considered.
25.745	all	Nose-wheel steering	No equivalent requirement in 14 CFR Part 25.
25.783	(d)	Fuselage doors, Latching and Locking	CS 25.783(d)(8) has no 14 CFR Part 25 equivalent.
25.787	(a)	Stowage compartments loads	The 14 CFR Part 25 applicability is limited compared with CS-25 in the application of the emergency landing condition to stowage and cargo compartments.
25.813	(a)	Passageways	CS 25.813(a)(2) is more stringent. Type C door for cross aisle requirement is not required by the 14 CFR Part 25.
	(c)	Access to Type III or Type IV exits	There are several technical differences in EASA text compared to CFR text, which are stricter on EASA side: access width restriction starts at 20 pax (60 for FAA), Type III passageway on three seat rows is no more than 13" (20" for FAA), and no FAA equivalent rule on automatic hatch.
25.851	(b)	Built-in fire extinguishers	The text difference between EASA and FAA ("anywhere") drives the compliance requirement on EASA side to be more conservative ("point-to-point concentration must be demonstrated as acceptable").
25.853	(g)	Ashtrays in lavatories	CS requires ashtrays on both sides while 14 CFR Part 25 only outside.
25.855	(b)	Liners	CS introduces Class F cargo or baggage compartment which is not defined by 14 CFR Part 25.
	(c)	Liner tests	
	(h)	Flight tests	

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
25.857	(b)	Class B	The CS class B cargo or baggage compartment definition is more restrictive.
	(f)	Class F	CS introduces Class F cargo or baggage compartment which is not defined by 14 CFR Part 25.
25.933	(a)	Turbojet reversing systems	CS-25 request the applicant to demonstrate thrust reverser inadvertent deployment is extremely improbable, or that the aircraft is fully controllable with a deployed thrust reverser, under conditions defined in AMC 25.933(a)(1).
25.963	(d)	Fuel tank, Survivable crash conditions	CS-25 is more extensive and stringent than 14 CFR Part 25 in defining the fuel tank crashworthiness criteria.
25.981	(b)	Fuel tank flammability	In addition to average flammability exposure limitation, CS 25.981(b)(1) features a limit on temperature increase.
25.994	N/A	Fuel System Components	CS-25 refers to another requirement (CS 25.721), which is an EASA SSD.
25.1155	all	Reverse thrust and propeller pitch settings below the flight regime	CS-25 requirement addresses inadvertent/ unintentional reverse selection or activation in flight, which is not yet addressed by 14 CFR Part 25.
25.1302	all	Installed Systems and Equipment for Use by the Flight Crew	No equivalent requirement in 14 CFR Part 25. May lead to significant differences in flight deck design.
25.1303	(b)	At each pilot station	CS 25.1303(b)(4): The specification “Which is powered from a source independent of the electrical generating system and continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system” is not included in 14 CFR Part 25. The same technical content appears in Sec. 121.305(k) however the installation and lighting requirements are not as detailed as in CS 25.1321.
25.1303	(c)	Speed limitation	CS-25 is more stringent.
25.1305	(a)	Powerplant Instruments	CS 25.1305(a)(2) is more stringent. At Amdt. 12, CS-25 introduces a new requirement for fuel system alerts, which has no 14 CFR Part 25 equivalent.

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
25.1309	(b)	Equipment Systems and Installations/Failure conditions	CS 25.1309(b) is more stringent since 14 CFR 25.1309(b) requirement does not include a "no single failure" criterion for the Catastrophic Failure Conditions.
25.1315	N/A	Negative Acceleration	No equivalent requirements in 14 CFR Part 25. (25.943 is limited to the engine and powerplant associated systems & components).
25.1316	(c)	Exposure to severe lightning environment	No equivalent requirements in 14 CFR Part 25.
25.1327	(c)	Adequate accuracy	No equivalent requirements in 14 CFR Part 25.
25.1329	(g)	Unacceptable loads / Flight path deviations	CS is more stringent - specifies load requirements.
25.1331	(a)	Instruments using a power supply/ Warnings	CS is more stringent - provides additional requirement on the failure of one power source.
25.1351	(c)	Electrical systems and equipment/ External power	CS requirement is more specific and stringent than the FAA one.
	(d)	Electrical systems and equipment/ Loss of normal power	The CS requirement is more stringent. CS requires operational without normal electrical power to complete the flight. FAA requires not less than 5 minutes.
25.1436	all	Pneumatic systems – high pressure	No equivalent requirement in 14 CFR Part 25 for pneumatic systems high-pressure.
25.1438	N/A	Pressurisation and Low Pressure Pneumatic Systems	CS-25 and 14 CFR Part 25 requirements are different. 14 CFR Part 25 provides specific testing target values compared with CS 25. There are also other significant differences.
25.1453	(a)	Sufficient strength	CS-25 is more stringent and has detailed specifications on system design not provided by 14 CFR Part 25.
	(c)	Number of parts	No equivalent requirement in 14 CFR Part 25.
	(d)	Protective devices	
	(e)	Pressure limiting devices	
	(f)	Discharge of devices	

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CS 25 (Book 1) paragraph	subparagraph	Requirement subject	Comments
25.1447	(c) (3)	Equipment standards for oxygen dispensing units	CS-25 requires at least two oxygen outlets and dispensing units in all work areas.
25.1501	(c)	Supplementary information	No equivalent requirement in 14 CFR Part 25. Additionally, CS 25.1501 refers to CS 25.1591, which is an EASA SSD.
25.1517	(a)	Rough air speed/ Rough air Mach number	CS-25 requires establishment of rough air Mach number (MRA). 14 CFR Part 25 does not require MRA.
	(c)	Use of MRA	
25.1535	all	ETOPS Design Approval	CS and CFR ETOPS requirement are different.
25.1583	(k)	Runway contaminants	CS-25 is more stringent. CS-25 requires a contaminant depth AFM limitation.
25.1591	all	Performance Information for Operations with Contaminated Runway Surface Conditions	No equivalent requirement in 14 CFR Part 25 regarding performance information for operations with contaminated runway.
25.1703	(e)	EWIS - same standard as original design	No equivalent requirement in 14 CFR Part 25.

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