Certification Memorandum

Air Medical Services with large aeroplanes

EASA CM No.: CM-CS-012 Issue 3 dated 17 January 2023

Regulatory requirement(s): 25.365, 25.562, 25.785(j), 25.785(h)(2), 25.801, 25.803, 25.831, 25.853, 25.869, 25.1411(f), 25.1415(e) 25.1441(b), 25.1447(c)(1)

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 above.
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.

Log of issues

Issue	Issue date	Change description
1	30.03.2020	First issue
2	08.08.2022	Clarification on structural deformation aspects, Oxygen mask drop, Provisions for Oxygen
3	17.01.2023	Update based on comments received during public consultation from 08.08.2022 to 09.09.2022

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1. Introduction

1.1. Purpose and scope

The purpose of this Certification Memorandum is to provide guidance to be considered by TC or STC applicants intending to apply for EASA approval of design changes related to "Air Medical Services" with large aeroplanes (Medical Evacuation, Ambulance conversion, Patient Transport Unit, Temporary Stretcher installation).

1.2. References

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

Reference	Title	Code	Issue	Date
SC-D25.803-01	Special Condition on "Medical Evacuation Configuration"		1	Aug 2022
CM-21.A-E	Approved Model List changes		01	Aug 2018
CAT.OPS	Commission Regulation (EU) No 965/2012 on air operations - Annex IV – Part-CAT / SUBPART B: OPERATING PROCEDURES	Regulation (EU) No 965/2012	Multiple	Multiple
CAT.GEN.MPA.140	Portable electronic devices	Regulation (EU) No 965/2012	Multiple	Multiple
SIB 2016-08	Portable Electronic Devices belonging to the Operator		Original	Jul 2016
SC-F25.1445-01	Special Condition: Installation of a therapeutic oxygen system	25.1445	1	Jan 2020
CM-21.A-CS-001	Classification of design changes to cabin interiors of Large Aeroplanes		2	Apr 2021
CM-S-009	Loading Conditions for Occupant Safety in Cabin Interiors		1	Oct 2018
CM-ECS-001	Minimum qualification standards for oxygen cylinders used on board aircraft		1	May 2018
CM-CS-007	Evaluation of aisle width with respect to seat installations	25.815	1	Jul 2018

1.3. Abbreviations

CS	EASA **C**ertification **S**pecifications
SC	**S**pecial **C**ondition

CM	**C**ertification **M**emorandum
EC	European Commission
CAT.OPS	**C**ommercial **A**ir Transport **O**perations / SUBPART B: **O**PERATING **P**ROCEDURES
CRI	**C**ertification **R**eview **I**tem
AML	**A**pproved **M**odel **L**ist

1.4. Definitions

Air Medical Services	Air medical services is a comprehensive term covering the use of air transportation, by aeroplane or helicopter, to move patients to and from healthcare facilities and accident scenes.
Certification Review Item	A Certification Review Item (CRI) is a formal administrative means within the certification process and provides a structured means of recording a wide range of items occurring throughout a certification project.

2. Background

Large Aeroplanes are frequently used in a Medical Evacuation or Ambulance conversion configuration to perform Air Medical Services.

The primary purpose of the Medical Evacuation or Ambulance flights is the transport of patients. The primary purpose of flights where Airlines supplement their cabin with temporary stretcher installations is transporting passengers.

However, both share several common design peculiarities that are not addressed in CS-25.

3. EASA Certification Policy

3.1. Medical Evacuation configurations

In August 2011, EASA published a Special Condition (SC) for large aeroplanes that are modified by the installation of a Medical Evacuation configuration.

Guidance for Air Medical Services was added to the Statement of Issue of this SC during later revisions.

It is the aim of this CM is to make this guidance available for Air Medical Services.

The Special Condition for Medical Evacuation Configurations has been revised and re-published as a stand-alone document under reference SC-D25.803-01 Issue 1.

See link:

https://www.easa.europa.eu/document-library/product-certification-consultations/special-condition-medical-evacuation-applicable

3.2. Guidance for Air Medical Services

The following guidance is applicable to the Special Condition on Medical Evacuation, as well as ambulance conversions, Patient Transport Units (PTU) or temporary stretcher installations.

Stretchers are commonly used for Air Medical Services. The design of the stretcher installation shall typically comply with the following CS-25 paragraphs:

- §25.561 Emergency Landing Conditions
- §25.625 Fitting factors
- §25.785 Seats, berths, safety belts and harnesses
- §25.787 Stowage compartments
- §25.789 Retention of items of mass in passenger and crew compartments and galleys
- §25.791 Passenger information signs
- §25.807 Passenger Emergency Exits
- §25.812 Emergency Lighting
- §25.813 Emergency exit access
- §25.815 Width of aisle
- §25.853 Compartment interiors
- §25.1447 Equipment standards for oxygen dispensing units.
- §25.1501 General
- §25.1529 Instructions for Continued Airworthiness
- §25.1541 Markings and placards

Depending on the aircraft and stretcher installation designs, this list above may not be exhaustive.

For stretcher integration for aircraft that do not hold a European C of A., design organisations are encouraged to consider for compliance demonstration elements of the presentation "EASA changes embedded in Non-EASA approved design", having been part of the EASA STC Workshop day 2 in EASA on 5th June 2018 - see https://www.easa.europa.eu/newsroom-and-events/events/stc-workshop-2018

In particular, design organisations should consider CS 25.785 (h)(2) on direct view to clarify whether the operator has specified cabin attendant seats to be occupied to ensure direct view.

Stretchers and their support units are typically compliant with CS 25.561 but do not comply with CS 25.562. This should be considered during the selection of the installation position(s) to limit the risk to other passengers. Fitting stretchers aft of bulky monuments will mitigate the absence of compliance with CS 25.562 (see GM2 CAT.OP.MPA.155(c)[1]). EASA does not require stretchers installations to comply with CS 25.562. In CS-25 amendment 13, EASA added the following text to CS 25.785(b):

[...] *However, berths intended only for the carriage of medical patients (e.g. stretchers) need not comply with the requirements of CS 25.562*.

To ensure compliance with structural strength requirements:
The installation should ensure that there is no contact of the stretcher legs or other parts including the patient with the adjacent seats during loading (e.g. emergency landing conditions). In addition, there should be enough distance to avoid a too high shear force on the seat tracks, which could result in a failure of this seat track and/or a detachment of one or more feet out of the track attachments.

[1] Design organisations are encouraged to support the operators in demonstrating compliance with CAT.OP.MPA.155 Carriage of special categories of passengers (SCPs)

The stretcher typically provides an adequate restraining means for the occupant. This includes devices such as shoulder harnesses, the appropriate number of body-belts and/or end board, taking into consideration the aircraft flight loads and the loads as defined under CS 25.561, reducing loads on the occupant's body to a minimum. Besides the protection of the occupant of the stretcher, all constructive features have to take into account the protection of other cabin occupants.

Regarding structural substantiation, special attention is recommended for stretcher installations in a canted position. This is typically the case in the most rearward position of wide body aircraft such as Boeing 777, Airbus A330 / A340.

Some installations might have a considerable impact on the ventilation of the cabin (subject to CS 25.831 specifications) and/or the effects of a rapid decompression (subject to CS 25.365 specifications). For the specific case of a Patient Transport Compartment, applicants are recommended to contact EASA for additional information. Considerations whether Interpretative Material in the structural domain is needed for isolated compartments can only be determined on a case by case basis.

Additional seats for medical attendants are expected to be certified like passenger seats if intended for use during Taxi, Take-off and Landing.

If the installation introduces additional adapters for the seat, early coordination with EASA is recommended. Considerations whether Interpretative Material is needed for seats on pallets or seats on plinth can only be determined on a case-by-case basis.

Applicants may be required to provide clarification regarding CS 25.791 (passenger information signs and placards). Stretcher occupants should have visibility when "Fasten Seat Belt" and "No Smoking" signs are illuminated.

For all large aeroplanes, compliance with CS 25.803 is demonstrated by an evacuation demonstration or by analysis based on earlier demonstration(s), in which stretcher installations are not present. The applicant for an Air Medical Services installation should therefore provide a reasonable evacuation concept and the associated procedures. Effectiveness of those procedures may need to be demonstrated. This concept should include the number of able-bodied persons involved in the evacuation of the stretcher occupant[2].

In reference to EASA Special Condition ref. SC-D25.803-01 on "Medical evacuation configuration" - a more extensive evacuation concept is requested by EASA in case of installation of more than one stretcher per main aisle.

Applicants are reminded that installed equipment (medical equipment, oxygen bottles, etc.) needs to be approved according to the applicable certification basis if part of the approved configuration.

A clear segregation between installation provisions and the approved configuration should be provided. Equipment that may be brought on board together with or carried by the patient(s) can be considered as loose items under operators' responsibility. If a passenger or crew member is not able to carry by him-/herself, a medical oxygen cylinder, (which is brought on board either on a stretcher or by a passenger), it cannot be considered as a loose item. A loose item can be safely stored without particular provisions.

See also Frequently Asked Question on Dangerous Goods and in particular Q1/Q2 quoted below:

https://www.easa.europa.eu/en/the-agency/faqs/air-operations#category-dangerous-goods
Q1: What are the rules for passengers using bottled oxygen on board an aircraft?
Q2: What are the rules concerning the carriage of portable air concentrators (POC) on board? Can they be used during the whole flight?

Further guidance is provided in Safety Information Bulletin SIB No.: 2016-08 - Portable Electronic Devices (PEDs) belonging to the operator, pointing also to CAT.GEN.MPA.140 Portable electronic devices.

[2] See note 1

Provisions for carriage of oxygen bottles are supported by EASA when appropriately placarded:

Provisions only. Not certified for use with pressurized Oxygen

To remove this placard, the applicant should go through a Major Change application process with EASA. There should be assurance that excess drop down oxygen masks are still available in case of decompression even if some of them are otherwise hidden by a stretcher curtain (e.g. for Cabin Attendants moving along the aisle).

If oxygen components are installed, AMC 25.1441(b) (created at Amendment 21 of CS-25) regarding risk assessment related to oxygen fire hazards in gaseous oxygen systems should be considered. For medical oxygen EASA may raise an additional Interpretative Material related to proper interaction with standards raised in the medical domain.

Note: Regulatory material and Guidance for oxygen system components inside an engine or APU rotor burst impact area are provided in CS 25.903(d)(1), CS 25J903(d)(1) and AMC 20-128A. Installing medical oxygen system components or provisions for carriage of oxygen inside an engine or APU rotor burst impact area should be avoided.

Consideration should be given for additional fire extinguishers if not already in the proximity of the oxygen installation or provisions for carriage of oxygen.

In case air medical service installations block the access or the view to cabin windows, the tasks within the instructions for continued airworthiness (e.g. window inspection) may need to be adapted accordingly.

Stretchers mattresses for new design approval shall comply with CS 25.853 that provides the cushion flammability test (oil burner) per Appendix F Part II.

In the spirit of CM-CS-007 - Evaluation of aisle width with respect to seat installations - applicants should verify compliance with aisle width requirements per 25.815 for all phases of flight. (e.g. applies to items like optional tables fitted to stretchers).

3.3. AML STC's

There are stretcher STC's on the market that are applicable to various aeroplane types per an Approved Model List. The Certification Memorandum EASA CM-21.A-E-001 Issue 01 specifies amongst other elements, that all models within a type are covered by the compliance demonstration.

3.4. Permanent installations

Whether an installation is "permanent" will be assessed by EASA on a case-by-case basis depending on the particular situation. As general guidance, applicants can assume that spending the majority of operating time in a Medical Evacuation / Ambulance configuration would be considered "permanent".

Applicants are reminded that permanent installations such as Ambulance conversions shall be fully compliant with the product's certification basis.

3.5. Who this Certification Memorandum affects

The guidance in this EASA Certification Memorandum is to be considered by Major Change or STC applicants presenting design changes related to "Air Medical Services" (Medical Evacuation, Ambulance conversion, Patient Transport Unit, Temporary Stretcher installation)

4. Remarks

1. This EASA Certification Memorandum was closed for public consultation on 9 September 2022.
2. For any question concerning the technical content of this EASA Certification Memorandum following publication of the final CM, please contact:

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