Initial Airworthiness Special Condition

Medical Evacuation Configuration

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EASA European Union Aviation Safety Agency	**Special Condition**	Doc. No.: SC-D25.803-01 Issue : 1 Date : 5 August 2022 Proposed ☐ Final ☒ Deadline for comments: 29 August 2022

SUBJECT	:	**Medical evacuation configuration**
REQUIREMENTS incl. Amdt.	:	**CS 25.803, 25.785(j), 25.785(h)(2), 25.1411(f), 25.1415(e) and 25.1447(c)(1) as applicable per the product TCDS**
ASSOCIATED IM/AMC	:	Yes☐ / No ☒
ADVISORY MATERIAL	:	---

INTRODUCTORY NOTE:

The following Special Condition has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) which states:

"*2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency.*"

IDENTIFICATION OF ISSUE:

This proposed Special Condition was first consulted in August 2011 for Medical Evacuation configuration only. The update and publication at Issue 5 removed guidance for Ambulance Conversions and temporary Stretcher installations being outside the scope of Medical Evacuation. Instead, EASA issued Certification Memorandum CM-CS-012 containing this related guidance. The essence of the Special Condition for Medical Evacuation Configurations remained as published at Issue 4, except editorial updates were implemented.

The Special Condition D-XX on "Medical evacuation configuration" at the latest Issue 5 was released by EASA on 30 March 2020 and can be found under the following link:

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

The associated Certification Memorandum CM-CS-012 was released by EASA for public consultation from 30 March to 20 April 2020 and can be found under the following link:

https://www.easa.europa.eu/document-library/product-certification-consultations/certification-memorandum-air-medical-services

With this update of the Special Condition on "Medical evacuation configuration" under the new reference SC-D25.803-01, more guidance and precision are added to address questions arising during past certification projects.
The conversion of the cabin of a large aeroplane from a passenger transport layout into a configuration to be used in case of Medical Evacuation (Medevac) foresees the installation of certain number of stretchers to

carry patients that could be incapacitated and/or non-ambulant. In some cases, a significant number of incapacitated patients could be carried on board.

The stretchers may directly be attached to the aeroplane seat tracks or be restrained to a support unit that is attached to the aeroplane structure. The stretchers and their support units are compliant with §25.561 but do not comply with §25.562.

A rapid occupant evacuation required by §25.803, does not address evacuation of incapacitated patients transported on a stretcher. Compliance with §25.803 is demonstrated by an evacuation demonstration or by analysis, based on evacuation demonstrations (as applicable), in which stretcher installations have not been assessed. Therefore, EASA expects the applicant to provide a concept of evacuation. This concept should include the number of able-bodied persons involved in the evacuation and the associated procedures. Effectiveness of those procedures may need to be demonstrated. As there are multiple evacuation scenarios that cannot be reasonably foreseen, authorization for transporting occupants in addition to those identified in the approved procedures for Medical Evacuation must be obtained by the NAA that is in charge to authorize the operation of the aircraft.

Based on past experience with the installations of medical evacuation configurations, EASA has identified the following areas that may not be in full compliance:

- §25.785(j), i.e. do not provide to occupants/crew members a means to steady themselves in case of turbulence (firm handhold),
- §25.785(h)(2), i.e. the existing cabin crew seats (if installed) in the changed environment may be installed so that cabin crew may have no direct view of all cabin areas during TT&L.
- §25.1447(c)(1) e.g. if stretchers are installed on top of another. In case of cabin decompression, oxygen masks may not be automatically presented to the patients on the stretchers and life preservers might not be within easy reach of stretcher occupants.

Applicants are generally encouraged to clearly segregate between installation provisions and parts of the approved configuration. More guidance regarding this aspect is provided in EASA CM-CS-012 on "*Air Medical Services with large aeroplanes*".

Stretchers sometimes incorporate mattresses, which may not be compliant with the overall §25.853 flammability requirement upgrade introduced by the cushion flammability test (oil burner) per CS 25 Appendix F Part II[1].

As CS 25 does not contain requirements that specifically address medical evacuation configurations, Special Conditions are needed to establish a level of safety compatible with that intended by the applicable airworthiness code.

ADDITIONAL CONSIDERATIONS:

EASA considers that it is reasonable to assume that critically sick patients will have reduced mobility and/or are in a reduced state of consciousness. This will impact on their ability to evacuate the aircraft unaided.

[1] Refer to the **Note** at the end of the Special Condition

Although compliance with §25.803 in the normal case assumes all occupants are fully able to evacuate the cabin, such an assumption has questionable validity in the case of the subject design.

Designs incorporating temporarily a low number (typically no more than one per main aisle) of stretchers into aircraft cabins primarily used to transport passengers have been approved in the past on the assumption that able-bodied persons will be requested to assist in the evacuation of the stretcher occupants and that in doing so the risk that they will endanger either themselves or other occupants is limited. The large number of stretchers in some of the medical evacuation layouts and the corresponding relatively low number of seated occupants no longer supports this assumption. It can only be concluded that, in certain cases, evacuation of stretcher borne occupants will be significantly slower than that of other cabin occupants.

Medical evacuation configurations installations may not provide:

- automatic access to supplemental oxygen in the event of a cabin depressurisation for the stretcher occupant
- a life preserver within easy reach for the stretcher occupant
- firm handholds in all areas
- cabin attendant “direct view” (ref. §25.785(h)(2)) – if applicable

These are additional examples where safety is compromised in comparison to the conventional passenger operations envisaged by CS25.

However, EASA appreciates that aeroplane cabins are configured for the medical evacuation of a considerable number of critically ill patients who depend on rapid repatriation. The number of flights made with such cabin configurations is assumed to be relatively limited.

After consideration of all the above, EASA agrees that practicable design solutions which would remove the above safety concerns are limited. Requiring literal compliance may lead to reducing the maximum number of stretchers allowed on the aircraft. This reduction would presumably result in more flights with an increase of the probability of an emergency evacuation of the aeroplane.

The provision of automatically presented oxygen masks for stretcher occupants whilst not impossible would be difficult to achieve when more than one stretcher is installed on the same support module (i.e. the lower stretcher occupant cannot make use of the PSU located masks). Improved firm handhold provisions and cabin attendant direct view of the cabin during taxi, take-off and landing would similarly be possible but not easy, and bearing in mind the characteristics of the intended operations (i.e. supervision by medical personnel familiar with the cabin interior) this would likely provide small additional safety.

For what concerns §25.562, the intention when the requirement was introduced was to provide an overall increased level of safety to occupants in a survivable accident. However, stretchers for medical use were not considered when the requirements of §25.562 were defined. As a matter of fact, appropriate injury criteria for a non-ambulant person occupying a stretcher do not exist for the time being. Therefore, EASA maintains the interpretation that CS §25.562 is not applicable to stretchers.

This is further supported as per CS-25 Amendment 13. At time of this CS-25 amendment, 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.*

Having considered the benefit of evacuating injured or critically sick people from areas where, for many different reasons, their health and/or safety is at high risk, EASA is of the opinion that non-compliance with §25.803, §25.785(j), §25.785(h)(2), §25.1411(f), §25.1415(e) and §25.1447(c)(1), can be sufficiently compensated by showing compliance with the following Special Conditions:

Special Condition to CS 25.803, 25.785(j), 25.785(h)(2), 25.1411(f), 25.1415(e) and 25.1447(c)(1) as applicable per the product TCDS

Medical evacuation configuration

a) In regard to seated occupants, each crew and passenger area must have emergency means to allow rapid evacuation in crash landings, with the landing gear extended as well as with the landing gear retracted, considering the possibility of the aeroplane being on fire. In regard to stretcher occupants, all practicable design precautions and operational procedures must be developed to facilitate evacuation without compromising the egress of cabin attendants and other occupants. Precautions may include features such as location relative to normal passenger seating and emergency exits, easy release of stretchers from their attachments to the a/c to enable patients to be stretcher borne to emergency exits, easily accessed patient restraint buckles to alternatively allow removal and direct carrying of patients, associated training/briefing procedures for attendants, etc. Proposed design precautions and procedures will be evaluated by the Agency for acceptability. An entry shall be made in an AFM supplement to define the procedure to be followed for the evacuation of the occupants of the stretchers. Authorization for transporting occupants in addition to those identified in the AFM supplement must be obtained by the NAA that is in charge to authorize the operation of the aeroplane.

b) In areas where closely spaced firm handholds cannot be easily provided as per §25.785(j), (e.g. along aisle portions where stretchers are installed) all practicable efforts must be taken to provide useable handholds to enable occupants to reach their designated seats. The proposed design will be evaluated by the Agency for acceptability. In all other areas where the cabin layout is similar to a standard airline layout (i.e. with seats installed on both sides of the aisle) firm handholds as normally expected for such seating areas must be provided.

c) To the extent practicable, without compromising proximity to a required floor level emergency exit, flight attendant seats must be located to face the cabin area for which the flight attendant is responsible.

d) The stowage provisions for life preservers described in §25.1415 must accommodate one life preserver for each occupant for which certification for ditching is requested. In the case of seated occupants, each life preserver must be within easy reach, whilst seated. For aeroplanes not certificated for ditching under §25.801 and not having approved life preservers for seated occupants, there must be an approved flotation means for each seated occupant. These means must be readily removable from the aeroplane. In the case of each stretcher occupants, regardless of the fact that the aeroplane is certificated for ditching under §25.801, there must be a life preserver in a stowage location that enables an able bodied assistant to quickly locate it and assist the stretcher occupant. Operational procedures must be developed (e.g. pre-flight briefing to appropriate persons) to facilitate that such retrieval and distribution will occur.

e) If certification for operation above 7620 m (25 000 ft) is requested, there must be oxygen dispensing equipment meeting the following requirements (See AMC §25.1447(c)):

(1) There must be an oxygen dispensing unit compliant with §25.1443 (c) connected to oxygen supply terminals immediately available to each cabin occupant.

(2) If certification for operation above 9144 m (30 000 ft) is requested, the dispensing units providing the required oxygen flow must be automatically presented to the occupants of flight attendant and passenger seats and to occupants of the stretchers before the cabin pressure altitude exceeds 4572 m (15 000 ft) and the crew must be provided with a manual means to make the dispensing units immediately available in the event of failure of the automatic system. In case it is not practicable to have oxygen dispensing units automatically presented to all occupants of the stretchers, all efforts should be made to provide the safest alternative possible. In any case, dispensing units should be within easy reach of the occupants of the stretchers and should be such that they can be accessed and operated without assistance. Procedures must be developed to ensure assistance to the occupants of stretchers from cabin attendants as soon as it is reasonably practicable following a depressurisation of the cabin. The design of the dispensing units, any required pre-flight briefing, and/or cabin attendant training and assistance procedures must be substantiated, and relevant information and limitations must be included in an AFM supplement.

(3) The total number of dispensing units and outlets must exceed the total number of seats and stretchers by at least 10%. The extra units must be as uniformly distributed throughout the cabin as practicable. (See AMC §25.1447(c)(1).)

f) As well as the entries discussed above, a supplement to the Aeroplane Flight Manual shall be developed containing a limitation stating that fare-paying occupants cannot be transported on the aeroplane.

g) The stretchers must provide an adequate restraining means for the occupant, taking into consideration the applicable ground and flight loads in addition to the requirements of CS §25.561. Moreover, the stretcher design must take into account the protection of other occupants (e.g. it must foresee appropriate padding of exposed protuberances, etc).

h) The cushion function of the stretcher mattress requires the stretcher mattress to comply also with CS §25.853(c), and therefore successfully pass flammability testing of Part II of Appendix F on CS 25[2].

i) Other dimensional requirements related to passageways, width of aisle, and exit size remain applicable without additional provisions for passage of stretcher or highly incapacitated occupant.

Note:

Regarding the compliance with §25.853(c) in previous consultations EASA reiterated the policy to require CS §25.853(c), and therefore successfully pass flammability testing of Part II of Appendix F of CS 25 for stretcher mattresses. Since EASA was made aware that existing designs for stretcher mattresses vary widely in terms of compliance with this requirement, EASA agreed to an implementation timeframe of 18 months counted from the end of the Special Condition Issue 3 final publication date which was 8 August 2011. After this date, EASA requires Part II of Appendix F of CS 25 for stretcher mattresses for all new design approvals.

[2] Refer to the **Note** at the end of the Special Condition