

Consultation paper
Equivalent Safety Finding

Doc. No. : ESF-F25.1445-02
Issue : 1
Date : 26 April 2022
Proposed ☒ Final ☐
Deadline for comments: 17 MAY 2022

SUBJECT : Pax to Freighter Conversion – Installation of a common supplemental oxygen system for flight crew and supernumeraries

REQUIREMENTS incl. Amdt. : CS 25.1445(a) Amdt. 18

ASSOCIATED IM/MoC¹ : Yes ☒ / No ☐

ADVISORY MATERIAL : --

INTRODUCTORY NOTE:

The following Equivalent Safety Finding (ESF) 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:

A request for an Equivalent Safety Finding (ESF) to CS 25.1445(a) at Amdt. 18 was submitted to EASA for a large aeroplane with a main deck class E cargo compartment.

CS 25.1445(a) at Amdt. 18 states the following:

Quote

(a) When oxygen is supplied to both crew and passengers, the distribution system must be designed for either

- (1) A source of supply for the flight crew on duty and a separate source for the passengers and other crew members; or*
- (2) A common source of supply with means to separately reserve the minimum supply required by the flight crew on duty*

Unquote

The baseline freighter configuration consists of a flight deck with 4 seats and a supernumerary compartment with floor-mounted seating for two supernumeraries forward of the 9g cargo barrier for a total of 6 seats.

This design change modifies the existing flight deck oxygen system originally used by the flight crew and up to 2 observer positions (4 occupants). This oxygen system is modified so that the common oxygen source also provides oxygen for two added supernumerary positions in the entry area, forward of the barrier wall. This results in a total supply of oxygen to 6 occupants. The proposed oxygen architecture consists of a common

¹ In case of SC, the associated Interpretative Material and/or Means of Compliance may be published for awareness only and they are not subject to public consultation.

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source of supply connected to a common oxygen distribution line for crew and supernumerary supplemental oxygen supply without means to separately reserve the minimum supply required by the flight crew on duty.

Considering all the above, the following Equivalent Safety Finding is proposed:

Equivalent Safety Finding to CS 25.1445(a) at Amdt. 18

Installation of a common supplemental oxygen system for flight crew and supernumeraries

1. Applicability

This ESF is applicable to Large Aeroplanes in Freighter configuration.

1.1 Affected CS

CS 25.1445(a) at Amendment 18

2. Equivalent Safety Finding

In lieu of direct compliance with CS 25.1445(a), and provided that the below compensating factors are complied with, the oxygen system may consist of a common source of oxygen supply to both flight crew and other crew members/occupants, without means to separately reserve the minimum supply required by the flight crew on duty.

The proposed design of the supplemental oxygen system for flight crew and supernumeraries meets the intent of the rule as the minimum oxygen quantity is ensured when considering the worst case scenario according to the applicable certification requirements and operational regulations.

3. Compensating Factors

- a) The design of the common oxygen source must be demonstrated to be able to provide the minimum oxygen quantity for flight crew and supernumeraries considering the worst scenario according to the applicable certification requirements and operational regulations.
- b) The AFM must include clear instructions to ensure before each flight that the minimum oxygen quantity is available for the scenario considered under paragraph a) above.
- c) Applicable limitations must be introduced in the AFM if the design of the common oxygen source is not able to provide the minimum oxygen quantity for the scenarios applicable in paragraph a) above.

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Associated Interpretative Material

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1. An analysis should be provided to demonstrate that the design of the common oxygen source is compliant with the applicable certification specification considering also the applicable operational regulation. This includes emergency scenarios related to cabin decompression (CS 25.1443(a)(b)(c)), protective breathing (CS25.1439(b)(5)), and the fire suppression procedure of a Class E cargo compartment (CS 25.857(e)).
2. The duration considered for the fire suppression procedure of the class E cargo compartment should include the maximum time the cabin altitude can be maintained depressurised at 22.000 ft or higher, until final descent and landing according to the oxygen availability.