



COMMENT RESPONSE DOCUMENT

Rev. 1 of EASA CRD of Special Condition to CS 25.855 Amdt 24

Applicable to Large Aeroplanes

[Published on 09 June 2020 and officially closed for comments on 07 July 2020]

Commenter 1: AIR FRANCE DOA EASA.21J.027 – E. Bodin / Certification Manager / 2 July 2020

Comment # 1

SC § 2.9.

This paragraph indicates the interactions of different contiguous compartments smoke/fire detection/extinguishing systems.

⇒ In the context of standard passenger commercial cabin arranged for cargo transport, the objective of this paragraph needs to be clarified.

EASA response: PARTIALLY AGREED

The Special Condition (SC) will be withdrawn and replaced with a Deviation. Relevant wording will be adjusted to better reflect the new EASA approach. This includes the comment above.

Comment # 2

SC § 3.2.

This paragraph indicates to identify the seats that shall be occupied by the required occupants in the cabin during taxi, take-off and landing, also in emergency scenarios such as turbulence or decompression.

⇒ In addition to above considerations, crew rest compartment occupancy during flight needs to be specified.

⇒ Particularly for overhead or lower crew rests for which accesses (normal and emergency exit) are in cabin areas used for cargo transport.

EASA response: PARTIALLY AGREED

The Special Condition (SC) will be withdrawn and replaced with a Deviation. Relevant wording will be adjusted to better reflect the new EASA approach. This includes the comment above.



Comment # 3

SC § 4.2.

This paragraph indicates that if cargo is secured on seats, it shall not be installed in seat rows fore and aft or leading to emergency exits.

- ⇒ If monuments (galley, lavatory, stowage, partition, ...) border and face passageways or cross aisles leading to emergency exits, it should be clarified if “cargo free” seat rows are still required.

EASA response: PARTIALLY AGREED

EASA considers the wording in the draft SC as unambiguous. However, the wording of the generic deviation will better clarify in which cabin areas it is prohibited to store cargo.

Comment # 4

SC § 4.3.

This paragraph indicates that there shall be a clear separation of areas occupied by occupants and those loaded with cargo.

- ⇒ “Clear separation” wording needs to be clarified.
⇒ Does it mean physical (monument) separation or marking?

EASA response: PARTIALLY AGREED

EASA considers the wording in the draft SC as unambiguous. However, the wording of the generic deviation will better clarify in which cabin areas it is prohibited to store cargo.

Comment # 5

SC § 5.4.

This paragraph indicates that cargo loading deflections and deformations under emergency landing condition loads shall not block emergency evacuation paths.

- ⇒ It is understood that emergency evacuation paths (longitudinal aisle(s), passageways and cross aisles) and exit doors not used in an emergency evacuation (as defined in SC § 3.6.) are not concerned. Please confirm.

EASA response: NOT AGREED

The actual use of the emergency path will depend on the number and location of occupants required in the AFM. In principle all exits are fully usable and all emergency path are expected to be available.

Comment # 6

SC § 5.7.c. iv.



This paragraph indicates that access provisions shall be unobstructed by cargo restraint means and considering the shifting of cargo items under the applicable ground, flight and emergency landing loads.

⇒ Could it be clarified why access provisions (20" wide longitudinal and 15" wide lateral) to cargo loading need to be unobstructed after an emergency landing?

EASA response: NOT AGREED

EASA considers the wording in the draft SC as unambiguous. The wording of the generic deviation will clarify that shifting of cargo under the applicable ground and flight loads shall not compromise the access provisions for fire-fighting. No access for fire-fighting needs to be provided after an emergency landing.

Comment # 7

SC § 6.1, 6.2 and 7.1.

These paragraphs indicate that electrical / Oxygen equipment which can cause an additional fire risk must be deactivated, removed, protected or relocated from areas in which cargo is transported.

- ⇒ Are exit door areas (passageways or cross aisles areas), located throughout a cabin area used for cargo transport, also considered as cargo area?
This precision is important as numerous electrical powered and/or Oxygen emergency equipment are stowed in exit doors areas (standard commercial cabin arrangement).
Emergency equipment still evenly distributed in the cabin in these areas would be helpful for rapid reachability in an emergency event.
 - See attached, Air France Operator analysis (and its attachments) relating to Portable Breathing Equipment (PBE) availability on B777 fleet.
- ⇒ Are monument (galley, stowage, overhead bin, ...) closed compartments used for batteries powered equipment stowage considered as acceptable protection?

EASA response: AGREED

The deactivation, removal, relocation or protection of electrical and oxygen systems is required in all cases in which a cargo fire could involve or start from one of those systems. The determination is based on proximity, as well as on the presence of protective barriers, between the transported cargo and the systems. EASA would like to outline that the requirement applies to systems that are not essential for the operation of the aeroplane in the configuration which allows transportation of cargo in the cabin. For example, electrically powered emergency exit marking must not be relocated if considered necessary for the safe evacuation of the cabin occupants. Relocation of electrical /oxygen systems in emergency exit areas delimited by monuments such as galleys, lavatories, bulkheads, stowage compartments, is considered as an acceptable solution provided that the new installation meets all applicable installation requirements (e.g. special conditions of lithium batteries) EASA will include in the generic deviation the requested clarifications.

Comment # 8

SC § 7.2.

This paragraph indicates that readily accessible portable oxygen shall be provided for the maximum number of occupants allowed in the cabin. The equipment shall meet CS 25.1439 (b) and CS 25.1443 (e) for hypoxia protection when walking around the cabin for fire detection.



- ⇒ Does portable Oxygen has to be provided to the maximum number of occupant if part of the aircraft built-in supplemental Oxygen system is still operative (part of cabin not used for cargo transport)?
- ⇒ It is understood that the equipment must meet both the requirements for firefighting and rapid decompression conditions. Please confirm.

EASA response: *PARTIALLY AGREED*

If the aircraft built-in supplemental Oxygen system is still operative, and a smoke barrier is installed, portable Oxygen does not need to be provided for Occupants not in charge of performing the applicable fire protection procedures

If no smoke barrier is installed, for Occupants not in charge of performing the applicable fire protection procedures, the equipment to be provided shall meet CS 25.1439 (b) for smoke protection, and CS 25.1443 (e) for hypoxia protection in case of rapid decompression if the aircraft built-in supplemental Oxygen system is not operative.

Occupants in charge of performing the applicable fire protection procedures shall be provided with equipment meeting both requirements for firefighting and rapid decompression

Commenter 2: Airbus Operations GmbH – S. Runge / Regulations Manager / 7 July 2020

Comment # 9

PDF page 2, section 5, quote:

"In case an applicant cannot or is not able to demonstrate compliance with this Special Condition or the stringent limitations to the kind of cargo transported in the cabin, a Deviation from the special conditions in Appendix A Chapter A may be proposed and will be assessed by EASA in accordance with point 21.A.101(e)1.(ii)."
Unquote.

Airbus Comment:

Appendix A, Chapter A is not available within the PDF provided for commenting.

Airbus request:

Please provide the information on "Appendix A, Chapter A".

EASA response: *AGREED*

The deviation replacing the draft SC will include this proposed improvement.



Comment # 10

PDF page 3, Special Condition, general comment to document's structure

Airbus comment:

To increase the readability of the CRI, the link between the individual requirements of the CRI (SC) and their corresponding Means of Compliance is proposed to be improved.

EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 11

PDF page 3, Chapter 1 – Allowed Cargo, sub-chapter 1

Quote:

“1: The AFM shall include limitations to the type of cargo that is allowed to be transported in the passenger cabin.”

Unquote.

Airbus Comment:

It is Airbus opinion that the Fire Risk Assessment is composed of the size and accessibility of the cargo, in combination with the type of cargo.

Airbus Request:

Airbus proposes, as a further Acceptable Means of Compliance to the SCs, to limit the volume and appropriate distance between pallets in a way that a fire can be detected and controlled before the fire has reached a certain extent. In addition, critical cargo items (other than dangerous goods which are excluded to be loaded in the cabin anyways) may be limited e.g. flammable fluids, batteries etc., i.e. it is Airbus opinion that an exclusion list of cargo, in combination with a limitation of the cargo size and accessibility, supports the intent of the SC adequately.

EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 12

PDF page 3



Chapter 2 – Fire Protection, wordings

Airbus Comment:

Changed wording and one “repositioning” of a listed item would create some more clarity.

Airbus Proposals:

Fire Protection bullet 1; change wording to read as follows:

1. The AFM shall include the firefighting procedures that are adequate to address the fire risk posed by the type of cargo carried on board and by the protection means installed or provisioned.

Fire Protection bullet 4; change wording to read as follows:

4. The performance of additional fire and smoke detectors, if installed, shall be demonstrated.

Fire Protection bullet 9; shift position to 6th bullet:

~~9.~~ 6. Depending on the fire protection means, it shall be demonstrated [...]

EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 13

PDF page3, Chapter 2 – Fire Protection, sub-chapter 9 (new 6), quote :

“#. Depending on the fire protection means, it shall be demonstrated that no inadvertent operation of smoke or fire detectors in any compartment would occur as a result of fire contained in any other compartment, either during or after extinguishment, unless the extinguishing system floods each such compartment simultaneously.”

Airbus Comment:

The original intention of this requirement is to avoid that Flight Crew floods the wrong lower deck class C Cargo compartment (fwd or aft) whereas in Cabin Areas it is important that the fire fighter identifies the passenger compartment area with the smoke source quickly. As such it should be acceptable that after a certain time a further smoke alarm may be triggered in any other cabin compartment (e.g. Lavatory).



EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 14

PDF page 4, Chapter 3 – Cabin Occupants, bullet 4, quote :

“Specify that the occupants required by special condition 3.1. shall be trained on:

- a. The operation of emergency exits (door opening, slide release)
- b. The location and usage of oxygen equipment (automatic and portable) and procedures to be followed in case of depressurization
- c. The usage of the two-way communication system between the flight deck and the cabin
- d. The applicable fire protection procedures (e.g. fire detection, fire-fighting)
- e. First aid.

5. Require that cabin”

Unquote.

Airbus Comment:

The proposed special condition should not mandate that the AFM contain any requirement related to the training of cabin occupants.

Airbus Proposal:

The Cabin Crew Data (CCD) must be established to address the training requirements specific to the transportation of cargo in passenger compartments.

Rationale:

Under EU regulation, the responsibility of TC and STC holder in terms of type-related training for flight or cabin crew is through the establishment of Operational Suitability Data. As per the Part 21, any de-sign change must be assessed for its impact on OSD and if OSD is impacted, the appropriate change to OSD must be addressed through the change to TC or STC.

If the cabin occupants required for the specific operation of cargo transportation in passenger compartments are cabin crew, the training requirements will be addressed through Cabin Crew Data subject to EASA approval through the change to TC or STC. Then operators will have to consider the approved CCD when developing the cabin crew training.

If the cabin occupants are from another type of personal, it is under the operator responsibility to establish the training needs.

EASA response: PARTIALLY AGREED

EASA agrees that the requirement related to the training of cabin occupants should be part of the Operational Suitability Data. As per the Part 21, any design change must be assessed for its impact on OSD and if OSD is impacted, the appropriate change to OSD must be addressed through the change to TC or STC.



EASA is not agreeing that the additional crew in the cabin that is used for the transportation of cargo is cabin crew. As there are no passengers cabin crew will not be required. However, similar to additional crew on cargo aircraft this additional crew can be cabin crew or other adequately trained personnel as defined by the operator. The deviation replacing the draft SC will be modified accordingly.

Comment # 15

PDF page 4, Chapter 3 Cabin Occupants, AFM content, bullet #7

Quote :

“7. Contain appropriate operating limitations for passenger and cockpit ventilation during firefighting, and after firefighting phase for smoke evacuation.”

Airbus Comment:

The wording “...operating limitations...” might be misunderstood.

Airbus Proposal:

The term "operating limitations" may be replaced by “operating procedure” or “operating instructions”.

EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 16

PDF page 4, Chapter 4 – Emergency Escape Routes, bullet 5, quote:

“5. The installation of cargo in the cabin shall not decrease the width of the aisle(s) as per CS 25.815 considering the shifting of cargo items under the applicable ground, flight and emergency landing loads.”

Unquote.

Airbus comment:

Shifting of cargo (impacting the nominal aisle width as per CS 25.815) shall be acceptable for emergency landing cases if it is demonstrated that the aisle provided by CS 25.815 is not needed to safely evacuate aircraft occupants.

EASA response: NOT AGREED



See also response to comment #5.

Comment # 17

PDF page 4, Chapter 4 – Emergency Escape Routes, bullet 6, quote:

“6. The installation of cargo in the cabin shall not obscure any portion of the required emergency exit marking and floor proximity emergency escape marking considering the shifting of cargo items under the applicable ground, flight and emergency landing loads.”

Airbus comment:

Shifting of cargo (impacting the nominal aisle width as per CS 25.815) shall be acceptable for emergency landing cases if it is demonstrated that the aisle provided by CS 25.815 is not needed to safely evacuate aircraft occupants.

EASA response: NOT AGREED

See also response to comments # 5 and 16

Comment # 18

PDF page 5, Chapter 5 - Cargo Loading, general

Airbus comment:

In the listing the counter #6 is in double use:

6. If Cargo Seat Bags are installed:

[...]

6. If the cargo installations do [...]

EASA response: AGREED

Thanks for spotting.

Comment # 19

PDF page 5, chapter 5 – Cargo Loading, bullet 7 (new count: 8), quote:



#. If cargo is loaded on the floor:

- a. The height of the cargo shall not exceed 127 cm (50 inches).
- b. The volume of each cargo loading area, whether on a pallet or directly tied to the floor shall not exceed 3.54m³ (125 ft³).
- c. For appropriate access to the cargo and for firefighting purpose the following shall be provided:
 - ii. A longitudinal aisle(s) width of at least 51 cm (20"). Each longitudinal aisle shall enable a crewmember to traverse it while walking upright.
 - iii. A lateral access fore and aft of each loading area of at least 30 cm (15") wide.
 - iv. Access provisions shall be unobstructed by cargo restraint means and considering the shifting of cargo items under the applicable ground, flight and emergency landing loads.
- d. Ventilation exhausts shall not be obstructed."

Unquote

Airbus Comment 11a:

The counter "c i" is missing.

Comment 11b:

Airbus considers the values from CS 25.815 as appropriate depending on the number of occupants. As such SC §5.8 is somewhat redundant:

- Reference be made CS 25.815 w.r.t width of aisle.
- Accessibility for firefighting purposes is already addressed in chapter 2.7.

Airbus proposes to re-visit the intention of bullet 5-7 (new 5-8).

EASA response: AGREED

The Special Condition (SC) will be withdrawn and replaced with a Deviation. Relevant wording will be adjusted to better reflect the new EASA approach. This includes the comment above.

Comment # 20

PDF page 7, MoC, Chapter 1 – Allowed Cargo, bullet 3,
quote:



“3. In case the strategy for fire protection is based on crew members manually fighting the fire, the AFM limitations should include a positive list of items with low fire risk (e.g. items that are non-flammable) that are allowed to be transported in the cabin. In case of no process to control the content of the cargo items that are transported in the cabin, the design of the cabin should be changed to be in compliance with CS 25.855 and CS 25.857.”

Airbus Comment:

The creation of a positive cargo list is not practical.

Airbus Request:

Airbus proposes an exclusion list of cargo, please see comment #3.

EASA response: NOT AGREED

The list of allowable cargo is an essential starting point to implement fire protection measures.

Comment # 21

PDF page 7, MoC, Chapter 2 – Fire Protection, bullet 3,

quote :

“3. Flight test data may be used to demonstrate compliance with the provisions of the special condition concerning:

- a. The entry of hazardous quantities of smoke or extinguishing agent into compartments occupied by the flight crew or crew in the cabin; and
- b. The dissipation of the extinguishing agent.”

Unquote

Airbus Comment:

Both, flight test data and analysis shall be allowed to substantiate the requirement.

EASA response: AGREED

A combination of flight tests and analysis is acceptable.

Comment # 22

PDF page 8, MoC, Chapter 2 - Fire Protection, bullet 4 (referring to PDF page 3, Chapter 2 Fire protection, bullet 5)

quote:



“4. Cabin ventilation should be minimized to cope with the number of aircraft occupants in order to minimize the oxygen supply to a potential fire.”

Unquote

Airbus comment:

Reduction of flow rate will not reduce oxygen concentration to an extent so that a potential cabin fire can be extinguished. The means to extinguish or control a fire are fire extinguishers. Usually, the difference in ECS flow settings is not substantial enough to have an impact on firefighting.

EASA response: *PARTIALLY AGREED*

It is acknowledged, that the difference in ECS flow settings is not substantial enough to have a significant impact on fire development, and the means to extinguish or control a fire are fire extinguishers. However it is EASA position, that keeping the ECS flow at minimum level is a precautionary measure, and without passengers on board there should be no reason to increase the ECS flow above the required levels.

For clarification, it is proposed to add at the beginning of the sentence that the ECS flow should be minimised during normal operation

Comment # 23

PDF page 8, MoC, Chapter 2 - Fire Protection, bullet 6:

quote:

“6. Regarding cockpit and cabin ventilation, it should be justified that the procedure contained in the AFM:

- a. Does not slow down the fire extinction during the firefighting phase
- b. Does not reactivate the fire after being extinguished during the smoke evacuation.”

Unquote

Airbus Comment:

The influence of the ECS settings on the firefighting phase is considered minor. Substantial impact of ECS setting will be on smoke removal only.

(Please see also comment #22)

EASA response: *NOT AGREED*

If the applicant can demonstrate that the influence of the ECS settings has no significant impact on fire fighting and fire re activation, then this item is complied with.

Text not modified



Comment # 24

PDF page 9, Chapter 5 - Cargo Loading, Sub-chapter 1 – Structural Integrity, bullet b.

Quote

“b. Appropriate special factors (CS 25.619) such as fitting factors (CS 25.625) and wear & tear factors (CS 25.561) should be applied. Refer to CM-S-002 “Frequent Removal of Interior Structures” for more guidance on the application of the wear & tear factor.”

Unquote

Airbus Comment:

The guidance on the “wear & tear” factor for cargo loading should become most simple.

Airbus request:

Please replace the reference to CM-S-002 modifying the wording to read as follows:

b. Appropriate special factors (CS 25.619) such as fitting factors (CS 25.625) and wear & tear factors (CS 25.561(c)(2)) will be applied as and where necessary on all cargo restraint components.

EASA response: NOT AGREED

The reference to CM-S-002 is more general and would cover more than just cargo restraint components (e.g. removal of cabin interior items).

Comment # 25

PDF page 10, MoC, Chapter 5 – Cargo Loading, sub-chapter 2, quote:

“2. Pressure Loads / Decompression.

In relation to pressure loads / decompression, the following considerations apply:

- a. All cargo packaging should be able to equalize or sustain the (delta) pressure occurring during flight.
- b. Features that allow for reduction of decompression loads should be maintained, i.e. pallets or cargo should not obstruct the operation of decompression vents or air flow.
- c. If a significant amount of cabin volume is taken by cargo and the remaining cabin air volume is correspondingly reduced, this will lead to an increase in decompression loads on the floor structure in upward direction in case of a blow-out occurring above the floor. Depending on the OEM analysis assumptions, this case may exceed the available floor strength and needs to be checked.”

Airbus Comment:



This requirement will be anyways covered by the compliance demonstration to CS 25.365.

EASA response: NOT AGREED

The first item a. is not explicitly required by CS 25.365, and the other two items b. and c. are considered as useful reminders.

Comment # 26

PDF page 11, MoC, Chapter 6 - Electrical System, bullet # 3

quote:

“3. Wires shall be removed, or kept installed unpowered, capped and stowed, being not accessible. Potential damage that could be created by the loading/unloading of cargo should be avoided.”

Unquote.

Airbus Comment:

This requirement does not adequately address the conversion to transport cargo in cabin.

Airbus request:

Please rephrase bullet #3 to address dedicated “loose-end-looms” resulting from cabin system or cabin component removals for provisioning of cargo restraining systems or components.

EASA response: NOT AGREED

EASA finds that the text included in paragraph 6.3. of the MOC section is adequate to address the safety concerns related to the deactivation and protection of the electrical systems that may remain installed in the cabin and therefore be exposed to damage when loading/unloading cargo. The effectiveness of the actual design solutions that are implemented to isolate/protect the affected systems will be evaluated by EASA considering that safety objective.

Commenter 3: AptoZ – B. Baldursson / Head of Design / 15 June 2020

Comment # 27

Section 5, item 7b. “The volume of each cargo loading area, whether on a pallet or directly tied to the floor shall not exceed 3.54m³ (125 ft³).”



This is too restrictive. Typical net sizes are used are IATA codes NMA/NAD/NMB that have the highest load rating. These nets are 96 inches x 125 inches and 118 in in height. Height will be restricted to 50 inches so maximum volume can be 347 cubic feet. Accounting for lateral 15” fore and aft the total volume should be close to 300 cubic feet and not less.

EASA response: NOT AGREED

Comment # 28

Means of compliance section 2, item 8. “The number, the type and location of fire extinguishers required to be installed in the cabin should be determined considering CS 25.851(a), AMC 25.851(a), AMC 25.851(a)(1), AMC 25.851(a)(2) and AMC 25.851(c), which include a reference to FAA AC 20-42D. In particular, fire extinguishers:”

Due to outdated fire extinguishers available means of compliance should be clear on the use UL rated (or equivalent)

- two UL 4A-80B:C halon 1211 fire extinguishers. 16 lbm of halon each.
- two UL 2A water fire extinguishers. 2.5 gallons of water each.

EASA response: PARTIALLY AGREED

The deviation replacing the draft SC will include a modified wording to address the proposal. However, Halon is not allowed any more for hand fire extinguishers by EU regulation.

Comment # 29

Structural loading limits and allowables (of the seats, cargo seat bags, pallets, nets, straps, seat tracks/beams,...) provided by the OEM should be adhered to, as well as any airframe limitations (weight and balance, floor loading capacity and running loads - per fuselage frame and in total). Minimum distance between adjacent load introduction points may be prescribed, e.g. for seat tracks/beams. For bulkheads that have a placard indicating maximum capacity, the cargo items stowed aft of these bulkheads should not exceed the maximum capacity indicated in the placard.

OEMs have provided data to airlines that is way to limiting for example 660 lbm (300 kg) on Boeing 767-300 aircraft. Using OEM data from weight and balance manual, seat track allowables, floor load allowables etc. you can shower greater loads can be carried. OEMs through SBs are allowing greater limits so the industry should ensure a level playing field here as long as you can substantiate loads carried.

EASA response: PARTIALLY AGREED



The reference in the Special Condition to structural loading limits, allowables and airframe limitations is not addressing any additional and more restrictive limitations provided to airlines by OEMs in support of COVID-19 related operations, but is referring to the data published in W&B Manuals as well as OEM published allowables. Using this published data may provide more cargo load carrying capability if properly substantiated.

Comment # 30

Missing in special conditions is a specially trained loadmaster should supervise loading of cargo.

EASA response: NOT AGREED

A loadmaster will not be part of an EASA approval.

Comment # 31

Section , Item 1. “The time to charge the non-electrical floor path marking stripes should be defined for a cabin fitted with cargo.”

This item is not necessary as long as cargo is limited to a seatback height (50 inches).

EASA response: NOT AGREED

A floor path marking system may be necessary depending on the number and location of occupants.

Comment # 32

Means of Compliance, setion 2, item a. “All cargo packaging should be able to equalize or sustain the (delta) pressure occurring during flight.”

This item needs to be clarified and samples of standards to use for packaging referred to. This is too general.

EASA response: NOT AGREED

EASA considers the wording in the draft SC as unambiguous.

Commenter 4: The Boeing Company – T. D. Sigler / Director, Global Safety & Regulatory Affairs / 7 July 2020

Comment # 33

Page: 1



Paragraph: REQUIREMENTS incl. Amdt.

THE PROPOSED TEXT STATES:

CS 25.855 Amdt 24

REQUESTED CHANGE: Please add these additional applicable requirements.

25.785(h) [Amdt 24], 25.812 (c) [Amdt 24], 25.813(b) [Amdt 24], 25.851(a)(8) [Amdt 24], 25.855 [Amdt 24], 25.858 [Amdt 24]

JUSTIFICATION:

The list of applicable requirements needs to be updated. It needs to list applicable requirements that will require some aspect of deviation that cannot meet direct compliance for these regulations when operating under this SC for carriage of cargo in the passenger compartment.

EASA response: PARTIALLY AGREED

The list of references will be adjusted.

Comment # 34

Page: 1

Paragraph: Identification of Issue, 2nd paragraph

THE PROPOSED TEXT STATES:

The proposed designs will change the passenger compartment into a cargo compartment.

REQUESTED CHANGE:

The proposed designs will change the passenger compartment **to allow some types of cargo carriage in the passenger cabin, instead of passengers, in a cabin area that was not designed as** a cargo compartment.

JUSTIFICATION:

This statement is inaccurate and not consistent with the intent of SC. It is not creating a cargo compartment, but adding severe restrictions that allow some type of cargo to be carried in a passenger compartment instead of passengers.

EASA response: AGREED

The deviation replacing the draft SC will include this proposed improvement.

Comment # 35

Page: 2

Paragraph: 3, second sentence

THE PROPOSED TEXT STATES:



Compliance with the Special Conditions can be demonstrated only through the introduction of severe restrictions to the type of cargo that can be transported in the cabin. The applicant needs to perform a risk assessment assuming that cargo items can be fully identified in content and are associated to a low fire risk.

REQUESTED CHANGE:

Compliance with the Special Conditions can be demonstrated only through the introduction of severe restrictions *to cargo type and limited time period, such as usage of an Airworthiness Limitation that requires a timeframe beyond which the Regulatory agency approval would need to extend or renew, due to the current COVID-19 crisis for cargo that* can be transported in the cabin. The applicant needs to perform a risk assessment assuming that cargo items can be fully identified in content and are associated to a low fire risk.

JUSTIFICATION: This statement is misleading; limiting the type of cargo that can be carried is not adequate to mitigate the additional risk of carrying cargo in the passenger compartment. Risk exposure = (rate) (time), the cargo restrictions is not believed to be robust, years past introduction, as limiting for temporary usage of this capability for a given scenario.

EASA response: AGREED

The Special Condition (SC) will be withdrawn and replaced with a Deviation. Relevant wording will be adjusted to better reflect the new EASA approach. This includes the comment above.

Comment # 36

Page:3

Paragraph: 1.1

THE PROPOSED TEXT STATES:

1. The AFM shall include limitations to the type of cargo that is allowed to be transported in the passenger cabin.

REQUESTED CHANGE:

Add to sentence *“and is in conjunction with an airworthiness limitation requirement to address a calendar time limitation, which would require regulatory approval to extend/renew.”*

JUSTIFICATION:

Risk exposure = (rate) (time), the cargo restrictions is not believed to be robust with regards to years past introduction, when compared to limiting this SC for temporary usage of this capability for a given scenario.

EASA response: AGREED

The Special Condition (SC) will be withdrawn and replaced with a Deviation. Relevant wording will be adjusted to better reflect the new EASA approach. This includes the comment above.



Comment # 37

Page: 3

Paragraph: 1.2

THE PROPOSED TEXT STATES:

2. Transportation of the following cargo in the cabin shall be prohibited:

- a. dangerous goods, and
- b. live animals.

REQUESTED CHANGE:

2. Transportation of the following cargo in the cabin shall be prohibited:

- a. **hazardous**/dangerous goods **including as defined by IATA for Dangerous Goods including lithium and lithium-ion batteries**
- b. piercing**
- c. rigid**
- d. dense**
- e. mail/postal packages**
- f. live animals

JUSTIFICATION: Adding more detail on the type of cargo to restrict and reduce risk including additional items to prevent undeclared, misdeclared, and incorrectly identification of cargo resulting in non-compliant shipments. The detail definition of restricted cargo will drive also consistency. The piercing, rigid, and dense cargo is to not be carried on the main deck due to hazards associated with potential occupant impact and airplane damage.

EASA response: PARTIALLY AGREED

EASA will adjust the list of cargo clearly prohibited per se.

Comment # 38

Page:3

Paragraph: 2.3

THE PROPOSED TEXT STATES:

3. It shall be ensured that the presence of a fire would be timely detected considering all approved operating configurations and conditions.

REQUESTED CHANGE:

3. It shall be ensured that the presence of a fire would be **detected and extinguished while in an early and manageable state** considering approved operating configurations and conditions.

JUSTIFICATION:

“Timely” needs to be further defined. The presence of a fire needs to be detected and the fire extinguished before becoming unmanageable. Therefore, we recommend removing the word timely.



EASA response: PARTIALLY AGREED

That proposed change of wording improves the understanding and intention.

Comment # 39

Page:3

Paragraph: 2.6

THE PROPOSED TEXT STATES:

6. There shall be means to protect the flight crew and any crew located in the cabin from hazardous quantities of smoke, flames, extinguishing agent or noxious gases.

REQUESTED CHANGE:

6. There shall be means to protect the flight crew and any crew located in the cabin from hazardous quantities of smoke, flames, extinguishing agent or noxious gases, **such as personal breathing equipment (PBE) equipment usage during the fire extinguishing along with operational procedures.**

JUSTIFICATION:

PBE is the primary expected means to mitigate hazardous quantities of smoke, flames, extinguishing agent, or noxious gases during the firefighting process. Airflow management will provide a means of clearing the cabin of hazardous quantities of smoke, etc, following extinguishment of the fire.

EASA response: PARTIALLY AGREED

The proposed wording helps to clarify the intention of this chapter.

A smoke barrier may also be installed to protect occupants from hazardous quantities of smoke, flames, extinguishing agent or noxious gases. Please refer to SC 7.3

Airflow management may also provide a means of clearing the cabin of hazardous quantities of smoke, flames, extinguishing agent or noxious gases, following extinguishment of the fire if adequately demonstrated

Comment # 40

Page:3

Paragraph: 2.7b

THE PROPOSED TEXT STATES:

b. There is an unrestricted access to the cargo transported within the compartment by the crew members equipped for fire detection and firefighting.

REQUESTED CHANGE:

b. **There is access, consistent with Para 5.0, to the cargo in the seats or cargo loaded on the floor,** within the compartment by the crew members equipped for fire detection and firefighting.

JUSTIFICATION:



Need clarification for “unrestricted” in order to link it to the requirements listed for cargo loading. Therefore, we recommend edits to the sentence to provide better clarity.

EASA response: NOT AGREED

The wording used in the draft SC is considered as appropriate.

Comment # 41

Page:3

Paragraph: 2.9

THE PROPOSED TEXT STATES:

9. Depending on the fire protection means, it shall be demonstrated that no inadvertent operation of smoke or fire detectors in any compartment would occur as a result of fire contained in any other compartment, either during or after extinguishment, unless the extinguishing agent floods each such compartment simultaneously.

REQUESTED CHANGE:

Inadvertent operation of smoke or fire detectors in any compartment could occur as a result of smoke generation during or after extinguishment within the passenger compartment carrying cargo.

JUSTIFICATION:

When manually fighting a fire in the passenger cabin, it is expected that smoke detection may occur in other compartments. However, the probability of a fire occurring simultaneously in another compartment is less than extremely remote as a fire at each location is on the order of $1E-7$. It can be assumed that detection in another compartment is caused by migrating smoke, not another fire, and the firefighting actions of the cabin crew would be known to the flight crew. This characteristic has occurred during flight test on current and converted freighters during main deck smoke and a subsequent lower lobe smoke detection. It is also noted that lower lobe cargo compartments only have halon extinguisher for a given compartment forward or aft, but not both).

EASA response: PARTIALLY AGREED

EASA can follow the justification provided by the commenter. The intention is that individual fire/smoke sources are detected. Triggering of alarms in other areas from smoke of another source already detected is an accepted side effect not impairing the principle requirement. Hence EASA prefers to not change the wording.

Comment # 42

Page: 4

Paragraph: 4.1

THE PROPOSED TEXT STATES:

1. The required emergency exits shall be easily accessible under any cargo loading condition.

REQUESTED CHANGE:



We recommend adding the following text:

Any emergency exit without sufficient access should have all exit markings and indications (including exit signs, door markings, emergency escape path floor markings) removed or obscured.

JUSTIFICATION:

Ensure that only useable exits are marked to avoid confusion in an emergency evacuation.

EASA response: NOT AGREED

Removal of exit markings for this kind of purpose in particular for potentially alternating operations of cargo on one flight and passengers on another one is considered as not practical.

Comment # 43

Page: 4

Paragraph: 3.7

THE PROPOSED TEXT STATES:

7. Contain appropriate operating limitations for passenger and cockpit ventilation during firefighting, and after firefighting phase for smoke evacuation.

REQUESTED CHANGE:

7. Contain appropriate operating ~~limitations~~ *procedures* for passenger and cockpit ventilation during firefighting, and after firefighting phase for smoke evacuation.

JUSTIFICATION:

Consistency within the SC where the emphasis within the Operational Suitability Data to cover this unique scenario.

EASA response: AGREED

Text is modified accordingly.

Comment # 44

Page: 4

Paragraph: n/a

The proposed text states:

REQUESTED CHANGE:

We recommend adding additional text.

7. The volume of cargo in the cabin shall not exceed the equivalent volume of passengers and baggage from the passenger configuration (including passenger seats and monuments) as higher volumes of cargo may prevent proper operation of the evacuation doors in the event of a water landing.

JUSTIFICATION:



Aircraft are certified for overwater operation per CS 25.803 and CS 25.807 which require that occupants are able to evacuate the aircraft in the event of a water landing. Loading of cargo on the main deck to a volume beyond the equivalent volume of passengers (based on the maximum passenger occupancy specified in the applicable TCDS) may reduce the cabin volume such that water leaking into the pressure vessel could increase the internal pressure and render the passenger doors unable to be opened and prevent occupant evacuation. As such these configurations may not meet the requirements in CS 25.801 and CS 25.807. By limiting the volume of cargo in the passenger cabin to the same as the airplane's passenger configuration, it will ensure that the flotation characteristics and occupant evacuation through the passenger doors is protected.

EASA response: NOT AGREED

In the case of cargo transportation the aircraft will be limited to no passenger transportation. The number occupants on board shall be limited to the minimum needed for the operation of the aircraft. All occupants (other than flight crew) will be placed near emergency exits for TTOL (including ditching). The occupants must be aware of the emergency exit operation. Therefore no additional risk for evacuation is identified. The deviation replacing the draft SC will not include this proposed wording.

Comment # 45

Page: 5

Paragraph: 5, Item 1

THE PROPOSED TEXT STATES:

1...shall be designed for the placarded maximum weight of contents and for the critical...

REQUESTED CHANGE:

1...shall be designed for the ~~placarded~~ **intended** maximum weight of contents and for the critical...

JUSTIFICATION:

Seats in general are not placarded, hence the intended weight, either an occupant or part of occupant weight shall be considered.

EASA response: PARTIALLY AGREED

It is the intention of this requirement to match the maximum weight of contents that can be stowed in a location with the maximum weight placard that would be required for that location. The deviation replacing the draft SC will include an improved wording.

Comment # 46

Page:5

Paragraph: 5.7c

THE PROPOSED TEXT STATES:

c. For appropriate access to the cargo and for firefighting purpose the following shall be provided:



- ii. A longitudinal aisle(s) width of at least 51 cm (20"). Each longitudinal aisle shall enable a crewmember to traverse it while walking upright.
- iii. A lateral access fore and aft of each loading area of at least 30 cm (15") wide.
- iv. Access provisions shall be unobstructed by cargo restraint means and considering the shifting of cargo items under the applicable ground, flight and emergency landing loads.

REQUESTED CHANGE:

Clarify sub paragraph numbering (missing "i") and specify requirements for sidewall access for cargo loaded on floor to provide adequate firefighting access and prevent window damage in addition to return airflow paths and decompression vent area flow paths.

JUSTIFICATION:

Access for firefighting and equipment and airflow paths need to be specified.

EASA response: PARTIALLY AGREED

Numbering will be corrected. Further clarification on sidewall access will be provided in deviation.

Comment # 47

Page:5

Paragraph: 5.7d

THE PROPOSED TEXT STATES:

d. Ventilation exhausts shall not be obstructed.

REQUESTED CHANGE:

d. Ventilation exhausts **and decompression panels** shall not be obstructed.

JUSTIFICATION:

Normal and potential airflow pathways need to be accounted for in the requirements.

EASA response: AGREED

Text is modified accordingly.

Comment # 48

Page: 6

Paragraph: 7.2

THE PROPOSED TEXT STATES:



2. Readily accessible portable oxygen shall be provided for the maximum number of occupants allowed in the cabin. The equipment shall meet CS 25.1439 (b) and CS 25.1443 (e) for hypoxia protection when walking around the cabin for fire detection.

REQUESTED CHANGE:

2. Readily accessible portable oxygen shall be provided for the maximum number of occupants allowed in the cabin. The equipment shall meet ~~CS 25.1439 (b) and~~ CS 25.1443 ~~(e)~~ (c) for hypoxia protection when walking around the cabin for fire detection.

JUSTIFICATION:

Carrying equipment meeting the protective breathing requirement of 25.1439 (b) is unnecessary as PBE is installed with firefighting equipment distributed throughout the aircraft.

Equipment providing hypoxia protection meeting 25.1443 (c) is adequate for a crew member to return to their seat.

EASA response: PARTIALLY AGREED

Equipment meeting both firefighting and hypoxia protection shall be provided to crew in charge of performing the applicable fire protection procedures

The other occupants not in charge of performing the applicable fire protection procedures, shall either use the aircraft built-in supplemental Oxygen system if still operative, or be provided with readily accessible portable oxygen meeting CS 25.1443 (e) for hypoxia protection in case of rapid decompression.

Text is modified to clarify the approach

Comment # 49

Page: 7

Paragraph: 2.1

THE PROPOSED TEXT STATES:

1. If cargo seat bags are used to transport cargo in the cabin, they should meet at least CS-25 Appendix F Part 1(a)(1)(iv) and (v). The appropriate flammability standard that the bags should meet needs to be derived from the risk assessment conducted as per Means of Compliance 1. above. For instance, for a certain type of cargo, it may be possible to establish a fire protection strategy that relies on fire containment rather than on manual fire-fighting. This will involve that the material and construction of the bags meet the same flammability standard as fire containment covers (ref. CS-25 Appendix F, Part III).

REQUESTED CHANGE:

Remove fire containment bags as the sole compliance means rather than manual fire-fighting.

JUSTIFICATION:

As written, this statement would allow Fire Containment Bags that don't require any manual firefighting precautions. This is not consistent with the SC intent and doesn't address possible thermal effects where that bag is located or toxic gas potential release issues.

EASA response: PARTIALLY AGREED

The comment is related to the MoC part of the published Special Conditions. This part is providing a possible means of compliance and it is not the only one. However, the deviation replacing the draft SC will consider the identified risk.



Comment # 50

Page: 8

Paragraph: 2.4

THE PROPOSED TEXT STATES:

4. Cabin ventilation should be minimized to cope with the number of aircraft occupants in order to minimize the oxygen supply to a potential fire.

REQUESTED CHANGE:

Include PBE as a means to mitigate hazardous quantities of smoke, flames, extinguishing agent, or noxious gases during the firefighting process. Airflow management procedures will provide a means of clearing the cabin of hazardous quantities of smoke, etc, following extinguishment of the fire.

JUSTIFICATION:

This statement is inconsistent with the special condition 2.6 to protect the flight crew and any crew located in the cabin from hazardous quantities of smoke, flames, extinguishing agent, or noxious gases. It is not feasible to minimize airflow while effectively and simultaneously preventing smoke penetration and facilitating rapid dissipation of extinguishing agent. Minimizing airflow is typically used to help suppress the fire, but for this scenario fire extinguishing is expected by cabin crew so ventilation for temperature, cabin pressure and contaminant dissipation is anticipated to be maintained. An appropriate ventilation procedure is required for this scenario. Extinguishing is expected by cabin crew so ventilation for temperature, cabin pressure and contaminant dissipation is anticipated to be maintained.

EASA response: PARTIALLY AGREED

The comment is related to the MoC part of the published Special Conditions. Protection from hazardous quantities of smoke, flames, extinguishing agent, or noxious gases is required by SC 2.6. Under MoC 2.9. a Smoke Hood (or PBE) is proposed as an acceptable means of compliance. However, a minimisation of the airflow as proposed under MoC 2.4. will have an impact when fighting a fire. Following to successful firefighting the ventilation may be switched to a higher value to evacuate any residual smoke, toxic gas or extinguishing agent (see also MoC 2.6.). The deviation replacing the draft SC will consider the identified scenario.

Comment # 51

Page: 8

Paragraph: 2.6

THE PROPOSED TEXT STATES:

6. Regarding cockpit and cabin ventilation, it should be justified that the procedure contained in the AFM:

- a. Does not slow down the fire extinction during the firefighting phase
- b. Does not reactivate the fire after being extinguished during the smoke evacuation

REQUESTED CHANGE:

Add a subparagraph that there shall be procedures to protect the flight and cabin crew during the fire extinguishing and smoke evacuation.

JUSTIFICATION:



In addition to the current statement a statement there shall be means to protect the flight and cabin crew. That PPE is the primary expected means to mitigate hazardous quantities of smoke, flames, extinguishing agent, or noxious gases during the firefighting process by the cabin crew. Airflow management will provide a means of clearing the cabin of hazardous quantities of smoke, etc, following extinguishment of the fire.

EASA response: *PARTIALLY AGREED*

The comment is related to the MoC part of the published Special Conditions. The deviation replacing the draft SC will consider the identified scenario. (see also reply to comment #50).

Comment # 52

Page: 8

Paragraph: 2.8

THE PROPOSED TEXT STATES:

8. The number, the type and location of fire extinguishers required to be installed in the cabin should be determined considering CS 25.851(a), AMC 25.851(a), AMC 25.851(a)(1), AMC 25.851(a)(2) and AMC 25.851(c), which include a reference to FAA AC 20-42D. In particular, fire extinguishers:

REQUESTED CHANGE:

8. The number, the type and location of fire extinguishers required to be installed in the cabin should be determined *by a risk assessment which considers (but not limited to) the cargo type, volume, location, screening accuracy, how the cargo is loaded, and the firefighting capability and training of the crew. See FAA AC 20-42D for guidance.* In particular, fire extinguishers:

JUSTIFICATION: 25.851 quantity requirements are based on passenger count, and has no direct correlation to carriage of cargo. The requested change clarifies that the fire extinguishing hardware and location is dependent on the cargo carried and not passengers.

EASA response: *PARTIALLY AGREED*

The clarification will be implemented in the deviation replacing the SC.

Comment # 53

Page: 8

Paragraph: MOC 2.8.c

THE PROPOSED TEXT STATES:

Current phrase "...capacity that is adequate for any fire to occur in the compartment..."

REQUESTED CHANGE:

Revise the phrase "...capacity that is adequate for ~~any~~ the fire to occur in the compartment..."

JUSTIFICATION:

The SC severely limits the type of cargo that can be loaded into the passenger compartment so the type and location of fire extinguishers can be more targeted.



EASA response: NOT AGREED

EASA considers the initial wording as appropriate.

Comment # 54

Page: 9

Paragraph: 5.1-c

THE PROPOSED TEXT STATES:

c...For bulkhead that have a placard indicating maximum capacity, the cargo items stowed aft of these bulkheads should not exceed the maximum capacity indicated in the placard.

REQUESTED CHANGE:

We request to change that statement to:

c...**Maximum capacity intended or indicated in the placard requirements for bulkheads, partitions, galleys, stowage bins, etc. must not be exceeded.**

JUSTIFICATION:

We can understand the intent that we do not load up bulkheads and partitions more than any intended bearing loads. Just reworded to make it more generic and applicable for adherence in all cases.

EASA response: PARTIALLY AGREED

The comment is related to the MoC part of the published Special Conditions. The Special Condition will be replaced by a deviation and the wording from the MoC part of the published SC will be used for the deviation as necessary.

Comment # 55

Page: 10

Paragraph: 2.c.

The proposed text states:

c. If a significant amount of cabin volume is taken by cargo and the remaining cabin air volume is correspondingly reduced, this will lead to an increase in decompression loads on the floor structure in upward direction in case of a blow-out occurring above the floor. Depending on the OEM analysis assumptions, this case may exceed the available floor strength and needs to be checked.

REQUESTED CHANGE:

We recommend adding the blue text below.

c. If a significant amount of cabin volume is taken by cargo and the remaining cabin air volume is correspondingly reduced, this will lead to an increase in decompression loads on the floor structure in upward direction in case of a blow-out occurring above the floor. Depending on the OEM analysis assumptions, this case may exceed the available floor strength and needs to be checked.



If a significant amount of cabin volume is taken by cargo beyond what would be taken up by passengers and baggage, the remaining cabin air volume is correspondingly reduced which will lead to an increase in internal pressure rise in the event of a water landing and prevent proper operation of the evacuation doors. Depending on the OEM analysis assumptions, this case needs to be checked.

JUSTIFICATION:

Aircraft are certified for overwater operation per CS 25.801 and CS 25.807 which require that occupants are able to evacuate the aircraft in the event of a water landing. Loading of cargo on the main deck to a volume beyond the equivalent volume of passengers (based on the maximum passenger occupancy specified in the applicable TCDS) may reduce the cabin volume such that water leaking into the pressure vessel could increase the internal pressure and render the passenger doors unable to be opened and prevent occupant evacuation. As such these configurations may not meet the requirements in CS 25.801 and CS 25.807.

By limiting the volume of cargo to the same as the airplane's passenger configuration, it is ensured that the flotation characteristics and occupant evacuation through the passenger doors is protected.

EASA response: AGREED

The proposed blue text will be incorporated in the new Deviation.

Comment # 56

Page: 11

Paragraph: 3.f

The proposed text states:

f. Applicants should verify if the assumptions that support the aircraft maintenance program (including the Airworthiness Limitations) remain valid due to the change in operations (e.g. change from passenger to cargo operation may invalidate the TC Holder's assumption on average payload factors or mission/flight durations used to establish the fatigue spectrum).

REQUESTED CHANGE:

f. Applicants should verify if the assumptions that support the aircraft maintenance program (including the Airworthiness Limitations) remain valid due to the change in operations (e.g. change from passenger to cargo operation may invalidate the TC Holder's assumption on average payload factors, ~~or~~ mission/flight durations used to establish the fatigue spectrum, *or changes in aircraft weight and balance*).

JUSTIFICATION:

EASA Air Ops Annex IV Subpart C Section 3 states that for airplane modifications where the accuracy of the weight and balance calculation is questionable, the aircraft must be reweighed. It is Boeing's position that significant interior modifications (such as removal of all passenger seats to enable cargo carriage on the floor) represent a situation where an analytical determination of the aircraft weight and CG is inaccurate.

Since the aircraft weighing procedure is part of Continued Airworthiness and an accurate determination of the aircraft weight and CG ensures safe flight and landing, the determination of the final aircraft weight and CG should be addressed in the SC.



EASA response: AGREED

Wording will be adjusted as proposed.

Comment # 57

Page: 12

Paragraph: MOC 7 2b

THE PROPOSED TEXT STATES:

b. In case the aircraft manufacturer cannot confirm that no oxygen is present in the passenger oxygen lines under normal operation, or the firefighting procedure includes cabin depressurization, the oxygen source should be deactivated and cabin occupants should be provided with portable equipment for hypoxia protection meeting 25.1443(e) for a sufficient duration.

REQUESTED CHANGE:

b. In case the aircraft manufacturer cannot confirm that no oxygen is present in the passenger oxygen lines under normal operation, or the firefighting procedure includes cabin depressurization, the oxygen source should be deactivated and cabin occupants should be provided with portable equipment for hypoxia protection meeting 25.1443(e) for a sufficient duration. *In this case, the definition of readily accessible for the portable oxygen equipment is to be within 5 feet or 5 seconds from each occupants' seat.*

JUSTIFICATION: The proposed change added clarity for readily accessible when the portable equipment is needed in lieu of automatically presented masks in the case of a depressurization.

EASA response: PARTIALLY AGREED

The proposed definition is the traditional and globally accepted one for EASA and valid for this CRI; there is no need to add it specifically here.

In addition, the part of the sentence dealing with oxygen portable equipment has been deleted since redundant with SC 7.3

Comment # 58

Page:12

Paragraph: 7.3

THE PROPOSED TEXT STATES:

3. For decentralized oxygen systems, gaseous or chemical, the applicant should either remove the passenger oxygen system, or assess the maximum temperature to which the PSUs could be subject in case of fire developing in the cabin. This assessment should conservatively consider the maximum time to detect the fire associated with the longest time to extinguish the fire, and the shortest distance between the cargo and ceiling.

a. If this temperature is below the one for which the system is qualified, the opening of the PSU oxygen door should be forbidden by using for example the test knob button.



b. If this temperature is above the one for which the system is qualified, the system should be removed or adequately protected from excessive temperatures. In no case, the protection means should adversely impact the capability of the crew members in the cabin or detection equipment/system, to detect the fire in due time. The protection means should also not obscure any portion of the required emergency exit marking and floor proximity emergency escape marking.

REQUESTED CHANGE:

For decentralized oxygen systems, gaseous or chemical, the severe limitations on cargo carriage and loading along with the operational procedures for fire extinguishing shall mitigate the risk of the elevated thermal environment affecting the oxygen equipment.

JUSTIFICATION:

The severe limitations on cargo carriage and loading along with the operational procedures for fire extinguishing can adequately mitigate the risk of the elevated thermal environment affecting the oxygen equipment.

EASA response: PARTIALLY AGREED

If the restrictions on the cargo are such that the operator is, for example, only transporting non-flammable material, many requirements in that SC, and associated MoC (including that MoC 7.3) can be alleviated

Commenter 5: Bucher Leichtbau AG– Laurentiu Nedelea/6 July 2020

Comment # 59

Chapter 5.7.a (Cargo) refers to the maximum allowed height (1.27m – 50 inches) of a cargo loaded on the floor. What drives this requirement? Can you please provide us with a rationale regarding this specific requirement? Is this rule applicable to mixed operations (passengers and cargo inside the same cabin)?

EASA response: PARTIALLY AGREED

The limitation to the maximum height and volume have been introduced in coordination with other aviation authorities. The height limit is introduced to allow access from the top of the cargo for firefighting and to provide a reasonable distance to the overhead stowage bin (when it remains installed).

Comment # 60

Chapter 5.7.b (Cargo) refers to the maximum allowed volume (3.54 m³ – 125 ft³) of a cargo loaded on the floor. What drives this requirement? Can you please provide us with a rationale regarding this specific requirement? Is this rule applicable to mixed operations (passengers and cargo inside the same cabin)?

EASA response: PARTIALLY AGREED

The limitation to the maximum height and volume have been introduced in coordination with other aviation authorities. The volume limitation was introduced to provide the possibility for successful firefighting. The volume limitation is originating from the max volume of a class B cargo compartment (200 ft³) and the



associated firefighting equipment. The reduction of the volume is meant to compensate for the missing liner (compared to a class B cargo compartment) and the possibly delayed smoke detection time (no 60 sec. smoke detector as required for class B Cargo compartments).

Commenter 6 : Dassault Aviation: Jean-Louis Cormier Certification Directorate 07/07/2020

Comment # 61

§ 2.2 page 3/12 Da proposes to add: “excluding luggage and loose equipment”

EASA response: NOT AGREED

§ 2.2 page 3/12 states: All materials installed in the cabin shall at least meet CS 25.853.

Luggage and loose equipment are not considered as part of the design and therefore they are not “installed” and are not part of the design. Therefore CS 25.853 is not applicable.

Comment # 62

§3.1 page 4/12. this requirement is not adapted to non-commercial operations and low-occupancy a/c (19 or less passenger seating) : there is 2 crew members in business jets who can watch and take action, Thus DA to propose to exclude this § for low-occupancy a/c (19 or less passenger seating).

Same comment for 3.2, 3.3 , 3.4, 3.5 and 3.6

EASA response: NOT AGREED

The special condition §3.1 page 4/12: “The AFM shall contain an operating limitation specifying the minimum number of crew members whose duties are to detect and fight a fire, and relay information to the flight crew. Additional occupants shall be justified based on a risk assessment.” Is introducing means to compensate for the missing design features when cargo is transported in a passenger cabin that is not designed to meet cargo compartment requirements. This is independent of the type of aircraft and the approved number of occupants.

Comment # 63

§ 3,8 page 4/12. for low-occupancy a/c (19 or less passenger seating) : there is 2 crew members who can watch and take action with smoke hoods and portable oxygen bottle, Thus DA to propose to exclude this § for low-occupancy a/c (19 or less passenger seating)



EASA response: NOT AGREED

There is no argument provided by the commenter why § 3,8 page 4/12 should not be applicable to “low-occupancy a/c (19 or less passenger seating)” when cargo is carried in the passenger cabin. It is the EASA position that in such configuration firefighting cannot be performed by the flight crew.

Comment 64

§4.3 page 4/12. this requirement is not adapted to non-commercial operations and low-occupancy a/c (19 or less passenger seating) : cabin for bizjet are around 10 m meters length with smaller volume than commercial a/c . It is not possible to have separated areas, thus DA propose to exclude this § for low-occupancy a/c (19 or less passenger seating)

EASA response: NOT AGREED

The requirement is aiming for the protection of cabin occupants when cargo is transported in the passenger cabin. There is no reason why cabin occupants of low-occupancy a/c (19 or less passenger seating) should have reduced protection.

Comment # 65

§4.4 page 4/12. This requirement is not adapted to non-commercial operations and low-occupancy a/c (19 or less passenger seating) : cabin for bizjet are around 10 m meters length with smaller volume than commercial a/c .As a consequence, each passenger is already seated near emergency exit (about 5m), thus DA propose to exclude this § for low-occupancy a/c (19 or less passenger seating)

EASA response: NOT AGREED

Passengers will not be allowed on board of aircraft when cargo is transported in the passenger cabin. The additional crew in the cabin will have to be seated near emergency exits for safety reasons.

Comment # 66

§ 5.7.a page 5/12. Due to the small size of bizjet cabin, and also due to non-commercial operation : there is no particular survey to be managed by attendant or flight crew member. As a consequence, DA propose no limitation on height, still considering that the design complies with §25,811(d) for low-occupancy a/c (19 or less passenger seating)

EASA response: NOT AGREED

See response to comment #59.



Comment # 67

§ 5.7.b page 5/12. Why this volume limitation ? DA proposes to delete it for low-occupancy a/c (19 or less passenger seating)

EASA response: NOT AGREED

See response to comment #60.

Comment # 68

§ 5.7.c page 5/12. Due to the small size of bizjet cabin : it is a single-aisle floor plan, which already comply with §25.815. Additionally, it is easy to access to lateral cargo area due to the small size of the fuselage. As a consequence, DA propose no 15" limitation wide around the cargo area for low-occupancy a/c (19 or less passenger seating)

EASA response: NOT AGREED

As stated in the text of § 5.7.c page 5/12 the 15" limitation is introduced to allow for appropriate access to the cargo and for firefighting purpose. This is not specific to the aircraft design but to the transportation of cargo in the cabin.

Comment # 69

§ 7.2 page 6/12. for low-occupancy a/c (19 or less passenger seating) : there is 2 crew members who can watch and take action with smoke hoods and portable oxygen bottle, thus DA propose to exclude this § for low-occupancy a/c (19 or less passenger seating).

Same comment for § 7.3

EASA response: NOT AGREED

When cargo is transported in the passenger cabin, additional crew needs to be transported to mitigate the risk of a cargo fire. The additional crew in the cabin is there to detect a possible fire and to perform the firefighting. This task cannot be performed by the flight crew. The additional crew in the cabin need to be protected in case of smoke, fire or decompression.

Commenter 7: Embraer S.A. – Alexandre Juliano Bianchi / Director, Regulations & DOA Management System / 07.07.2020

Comment # 70

Regarding the proposed Special Condition for transportation of cargo in passenger compartments EMBRAER would like to offer the following comments:



Page 4 , Item 4.4: "Cabin occupants shall be seated near an emergency exit on each side of the fuselage"

The EMBRAER aircraft comply with "1 flight attendant for 50 passengers rule" (ref. RBAC/14CFR 121.391(a)) and does not have flight attendant seats located on each side of the fuselage. However, due to the short cross section dimensions of a typical single aisle aircraft, the flight attendant seats are indeed located near the floor level emergency exits which allows the flight attendants to perform their all required emergency duties.

Considering the above, we suggest changing the item 4.4 to "Cabin occupants shall be seated near a floor level emergency exit".

EASA response: *AGREED*

Special Condition 4.4 will be amended as proposed: "*4.4. Cabin occupants shall be seated near a floor level emergency exit*".

Commenter 8: Expleo Germany GmbH – Konrad LEHMANN-VON WEYHE / Head of Office of Airworthiness / EASA.21J.657 – 07 July 2020

Comment # 71

Re: Page 5, section 5., sub-section 7, item a.

The hard limitation of the height of the cargo to 50" is arbitrary. Expleo has performed successful cabin safety inspections for a design in an A320 family aircraft (successfully certified under an STC by an NAA with which EASA has quite an extensive bilateral agreement) with a maximum height of 52" for each tie down area. Cabin inspection resulted in excellent cabin viewing results from the stations of the crew members responsible for detecting and fighting fires in the cabin. In case of an A320 cabin, the distance between the top of the cargo and the OHSC remains above 10" (at 52" cargo height) to both provide viewing and separation for fire containment aspects.

Expleo suggests the following change to the wording:

- a. The height of the cargo shall not exceed 127 cm (50 inches), *unless the applicant can demonstrate that an increased height of cargo does not adversely affect any aspects of safety of the concept, such as cabin viewing, fire detection, firefighting or any other aspect considered relevant by the Agency.*

EASA response: *NOT AGREED*

The height limit was not only introduced for cabin viewing but also for accessibility to the cargo in case of firefighting. See also response to comment #59



Comment # 72

Re: Page 5, section 5., sub-section 7, item b.

The hard limitation of the volume for each cargo area to 125ft³ seems arbitrary. Expleo has performed successful compliance demonstrations (and holds STCs) for two designs on single aisle and regional turboprop aircraft based on a different approach. Using guidance from EASA available prior to the COVID crisis (AMC 25.855 and 25.857 Cargo or baggage compartments), the following approach was developed: Each cargo area was designed in a way to be fully accessible while using a hand fire extinguisher (accessibility as per section 5. b. (1) of the AMC for a Class B compartment). In order to compensate for the lack of a fire proof liner (as it would be required for a class B compartment), the types of cargo are limited, the supervision of the cargo areas increased (dedicated crew on duty, exclusively for the purpose of supervising cargo) and an additional requirement added to ensure that at least 2/3 of each cargo area is accessible from two or more sides (allowing for simultaneous firefighting by two or more crew members. This concept allows for much better use of the available cabin volume while at the same time providing a very high level of safety with regards to fire detection and firefighting. The structural aspects for those zones were also evaluated and compliance demonstrated with the applicable regulations.

Expleo suggests the following change to the wording:

- b. The volume of each cargo loading area, whether on a pallet or directly tied to the floor shall not exceed 3.54m³ (125 ft³), *unless the application can demonstrate that an increased volume of cargo per cargo area does not adversely affect any other aspects of safety of the concept, such as cabin viewing, fire detection, firefighting or any other aspect considered relevant by the Agency*

EASA response: NOT AGREED

See response to comment #60.

Commenter 9: Federal Aviation Administration, 2 July 2020

Comment # 73

P.3 and p. 7, Item 1, Allowed Cargo. The FAA understands that EASA's intent is to limit the allowable cargo such that the provisions in the special condition will result in an equivalent level of safety to that provided by the certification standards. However, the proposed special condition language, as well as the means of compliance are somewhat vague about what this would entail. The only example given is non-flammable cargo that, while certainly addressing the fire safety aspects, is probably not a practical limitation, and in any case the packaging will likely be flammable. Considering the limits on cargo would have to be part of the design approval in accordance with the special conditions, the FAA recommends that in the interests of standardization, a more comprehensive discussion of criteria be included and a list of acceptable cargo be included in the means of compliance. The FAA agrees that a fire risk assessment is necessary, however, in the



absence of criteria on which to base the assessment, the outcome will likely vary greatly among applicants. Note also that the FAA considered whether limitations on cargo would be a viable approach to maintaining the level of safety required by the regulations, and determined that it was not feasible in actual practice.

EASA response: PARTIALLY AGREED

EASA agrees that international harmonisation and standardisation is of high importance. EASA also agrees that the required fire risk assessment is imposing a big challenge and that the outcome will likely vary greatly among applicants. It is therefore proposed to cancel the special condition approach. Instead EASA will make use of the text and comments received to draft a generic deviation that will introduce additional limitations to better address the concerns raised.

Comment # 74

P.3 Item 1 cargo. It would be advantageous and provide safety guidance to specify the cargo that is precluded from being contained within the cabin, such as dense, piercing and oversized. Perhaps adding a line item 1.3 'precluded cargo' and identify specifically those types.

EASA response: AGREED

The proposal will be considered for the deviation.

Comment # 75

p.3, Item 2.8. Fire Protection. Given that the loading of cargo on the main deck of a passenger airplane is not addressed in the certification requirements, the FAA recommends more definition in the types and sizes of fire extinguishers required. The existing proposed special condition is appropriate, however as above, the applicant will benefit from a baseline on which to conduct their assessment. The FAA has established minimum types and quantities of fire extinguishers in exemption 18561, for reference.

EASA response: PARTIALLY AGREED

EASA agrees that similar to comment #73 the required fire risk assessment is imposing a big challenge and that the outcome will likely vary greatly among applicants. On the other hand also the loading conditions and the transported goods may vary greatly and some adjustments to the firefighting and the associated equipment might be acceptable when properly justified by the applicant.



Comment # 76

p.4 3.4 Cabin Occupants. Based on the FAA's experience regarding how the need for training is interpreted, the FAA recommends EASA include explicit requirements for hands on training, where such training is expected to be necessary. For example, the fire fighting procedures for this situation are new (as will be the equipment), and therefore training based entirely on classroom-oriented presentation is not likely to provide a sufficiently realistic understanding of the procedures.

EASA response: PARTIALLY AGREED

EASA agrees that specific training for the additional crew in the cabin that is responsible for the smoke detection and the manual firefighting is needed. In the EASA regulatory framework this is covered by the OSD process. The need for the training will be detailed in the deviation that will be raised for the transportation of cargo in the cabin.

Comment # 77

P.5 item 5., Consider requiring an inspection for items made out of fabric, as these would need to be inspected before a determination of repair is accomplished.

EASA response: PARTIALLY AGREED

EASA understand that this is an important issue. The required component maintenance manual of cargo loading equipment should address regular inspections.

Commenter 10: GDC Engineering GmbH – Stephen Tiernan / Head of Design Organisation / 22nd June 2020

Comment # 78

Comment in response to SC 5.7.b:

Please can EASA indicate what hazard the volume restriction of 125 cu ft intends to mitigate against? Is there a rationale for the figure stated?

It is felt that the requirements of 5.1, 5.2, 5.3, 5.4, 5.7.a, 5.7.c and 5.7.d provide adequate requirements and constrains that the DOA will need to show compliance to that naturally limit the size of the cargo loaded directly onto the floor or via pallets on an aircraft to aircraft basis. A single limiting value does not seem appropriate for all aircraft variants encompassing narrow and wide body types.

EASA response: PARTIALLY AGREED



Request for clarification. See response to comment #60.

Commenter 11: IATA - Dragos Munteanu Assistant Director Safety & Flight Ops – 6.07.2020

Comment # 79

Page 1/12 – General Comment: while there are clear aircraft design and operational certification limitations which must be addressed, the use of a SC as defined in Part 21, 21.B.75 (and associated GM) in order to address transportation of cargo in passenger compartments would probably be justified if we consider that an aircraft which normally carries cargo only in cargo compartments would be used in an unconventional way (i.e. transportation of cargo in the passenger compartment). However, linking this SC to CS 25.855 and CS 25.857 raises a procedural inconsistency since the passenger compartment is not a cargo compartment and thus, formally, neither CS 25.855 nor CS 25.857 would apply to the passenger compartment.

EASA response: AGREED

EASA agrees that the special conditions may not adequately address all aspects that need to be considered for the unconventional way of transporting cargo in the passenger cabin. The Special Condition will be replaced by a generic deviation. The comment will be considered for the new deviation.

Comment #80

Page 1 and 2/12 – General Comment: only an aircraft TC/STC Applicant would be a potential user of this SC or Deviation from it and, thus, Operators would be not eligible unless they acquire the status of TC/STC Applicant. Thus, by proposing a CS 25 related SC, the Agency would close the door to Operators for applying directly for transportation of cargo in the pax compartment. Additionally, what would happen in the case of so many existing aircraft with pax cabins which were certificated in accordance to CS-25 at previous amendments and without including in their certification basis this proposed SC. Would all those TC Holders have to re-open their certification basis to add in the TCDS this new SC in order to enable the operator of that aircraft type to fly with cargo in the pax compartment?

EASA response: NOT AGREED

Special conditions and/or deviations are an adequate tool for design changes. Operator will still have the possibility to request an Article 71 exemption from their NCA. The acceptance of transportation of cargo in a passenger cabin is considered to be a temporary means to help under the severe impact of the CORONA Crisis on aviation.

Comment # 81



Page 3/12 – 2. Fire Protection section Comment: point 3 wording should be harmonized with point 5; we propose the wording “~~It~~ There shall be means ~~ensured that~~ by which the presence of a fire would likely be timely detected considering all approved operating configurations and conditions.”

EASA response: AGREED

The wording in the deviation will be adapted accordingly: 2.3. There shall be means by which the presence of a fire would likely be timely detected considering all approved operating configurations and conditions.

Comment # 82

Page 4/12 – 3. Cabin occupants section Comment: while point 3.1 introduces the category of “cabin occupants” it should be made clear if “passengers” could qualify (following the risk assessment required) for being such “occupants”. According to point 3.4 this may not be the case except for special categories of passengers (like company flight crew personnel etc.)

EASA response: AGREED

Clarification will be provided in the deviation that the transportation of passengers in the cabin will not be acceptable when cargo is loaded in the cabin.

Comment # 83

Page 4/12 – 3. Cabin occupants section Comment: point 3.7 wording should be reviewed to state “Contain appropriate operating limitations for ~~passenger~~ cabin and cockpit ventilation during firefighting, and after firefighting phase for smoke evacuation.”

EASA response: AGREED

The wording will be improved as proposed.

Comment # 84



Page 4/12 – 3. Cabin occupants section Comment: point 3.9 wording should be reviewed (considering the requirements of 3.4) to state “Require crew members or cabin occupants designated by a crew member to conduct a visual inspection of the cargo on a regular basis including prior to take-off and landing.”

EASA response: NOT AGREED

The wording “crew member” is covering flight crew as well as the additional crew in the cabin that is tasked with the regular check of the cargo in cabin.

Comment # 85

Page 4/12 – 4. Emergency escape routes section Comment: point 4.2 should be reworded (for harmonization with 4.1 and considering that not all emergency exits certificated for the transportation of passengers are required) to state: “If cargo is secured on seats, it shall not be installed in seat rows fore and aft or leading to required emergency exits.”

EASA response: AGREED

The wording will be improved when drafting the deviation.

Comment # 86

Page 5/12 – 5. Cargo loading section Comment: point 5.7.d. should be reworded to state: “Ventilation exhausts or decompression protection panels shall not be obstructed.”

EASA response: AGREED

The wording will be improved accordingly when drafting the deviation.

Comment # 87

Page 7/12 – Means of Compliance general comment: while we understand that the Means of Compliance section is not open to public consultation, we suggest that the Agency accepts that the published means of compliance are not considered to be the only ones acceptable for establishing compliance with the proposed SC and this



approach is captured in the opening text as follows: “The associated Means of Compliance is published for awareness only ~~and~~, is not subject to public consultation and is not considered to be the only means of compliance with the applicable provisions of this SC.”

EASA response: AGREED

However, the special condition will be replaced by a deviation and the MoC part will be changed into Interpretative Material to the mitigations required for the deviation.

**Commenter 12: J&C Aero, Thomas Rathmann-Ramlow/Consultant/07.07.2020 and
J&C Aerospace Design and Certification Services EEU Ltd. – Maksim JURKOV / Head of Design / 07 July 2020**

Comment # 88

REQUIREMENTS incl. Amdt.: **CS 25.855Amdt 24** – There are more paragraphs affected which need to be listed, the mentioned amendment is not the one at which this paragraph was revised

EASA response: PARTIALLY AGREED

EASA will review the requirements to be listed in the proposed deviation and add missing paragraph. However, as this is a generic set of requirements the current CS Amdt. will be the reference.

Comment # 89

Identification of issue 3rd para: The design of the passenger cabin does not meet any of the cargo compartment class definitions given in CS 25.857. There are as well class A and B cargo and baggage compartments which do fit into passenger cabins and meet the requirements of CS 25.857.

EASA response: NOT AGREED

It is true that there are classes of cargo compartments that can be designed to be on the same deck as the passenger cabin. However, the passenger cabin itself is not meeting any category of cargo compartment.

Comment # 90



It should be clearly stated that the SC are intended for the transportation of cargo only, no passengers allowed. There is already one STC where passengers and Cargo seatbags are installed in the same cabin.

EASA response: *AGREED*

EASA will improve the text to clearly state that no passengers will be allowed when cargo is transported in the passenger cabin.

Comment # 91

Special condition: In lieu of CS 25.855(a), (b), (c), (d), (h) and (i) the passenger cabin compartment, when used as cargo compartment, shall meet the following special conditions: - This is not in line with the identification of issue see also comment #2 above

EASA response: *AGREED*

See response to comment #88

Comment # 92

Firefighting: 2.All materials installed in the cabin shall at least meet CS 25.853. Specific cargo compartment design must comply with Appendix F Part III which is not listed in 25.853. This is not adequate to for ex. Class C cargo compartment design.

EASA response: *PARTIALLY AGREED*

EASA agrees that the flammability requirements for cargo compartments are not listed in 25.853. However, to set the minimum standard for the transportation of cargo in the passenger cabin CS 25.853 is the minimum. As required by the regulation, cargo compartments must meet the flammability requirements of CS 25.855.

Comment # 93

4.Emergency escape routes1.Therequired emergency exits shall be easily accessible under any cargo loading condition. – A new definition of required emergency exit might be helpful because 25.807 is linked to passenger seats rather than cabin crew and fire fighting personal. The location of the crew during TTOL or possible alternatives must be defined and consistent evacuation paths, exit, and slides or slide rafts to be defined. Ditching should be substantiated as well, as long haul flights are often over-water routes

EASA response: *AGREED*



EASA agrees to the comment. However, it is the responsibility of the applicant to define the seating of the crew in the cabin and the associated emergency exits. Some guidance on where additional crew can be placed is available in other parts of the document.

Comment # 94

Comment type: General

J&C Aerospace Design and Certification Services EEU Ltd (J&C Aero EEU) Thank the Agency for the preparation of this NPA.

After reviewing the document, it occurs that the document describes different aspects of the same certification requirement for Cargo Seat Bags (CSB) and Cargo Secured on Floor (CSF) differently. The determination of specific requirements becomes unclear, especially for instance in regards of §25.853 and §25.855. The proposed approach would be to firstly define the different type of cargo restrain solutions (e.g. nets, bags, compartments etc.) and types of cargo and then follow the same assessment of certification specification requirements for CSB and CSF.

J&C Aero EEU identified several concerns associated to the way it is presented in the NPA:

1/ ref. chapter 4 para 2 ‘If cargo is secured on seats, it shall not be installed in the seat rows fore and aft or leading to emergency exit.’

Suggested rephrasing: If cargo is secured on seats, it shall not be installed in the seat rows fore and aft or leading to emergency exit. If cargo is installed on the floor it cannot be installed in emergency exits. Free access path and minimum 38 cm (15”) access fore and after to each emergency exit must be maintained.

Not required exits due to low occupancy, for instance occupants are solely located in the front of the cabin, should be separately evaluated. Careful and conservative selected limitations must be stated within the AFM.

2/ ref. chapter 5 para 6 (a) ‘as specified in CS 25.787(a), the cargo seat bags must fully enclose the content and the enclosure shall meet the load conditions mentioned under 5.1’

We also would like to clarify if there are no certification requirements for completely enclosed CSF? An assessment of the consequences of the risks related to CSB and CSF related to 5.6(a), 5.6(b) should at least be similar.

3/ ref MoC chapter 2 para 1 ‘if cargo seat bags are used to transport cargo in the cabin they should meet at least CS-25 Appendix F Part 1(a)(1)(iv) and (v)....’

Comments: Does it mean that the cargo secured with net is less critical than cargo installed on the passenger seats?

Suggested solution: Implementation of classification of the type of non-dangerous cargo loaded within the passenger cabin. For instance, Class 1 requires that the used main materials comply to at least CS-25 Appendix F Part 1(a)(1)(iv) and (v), Class 2 requires that the used materials comply to at least CS-25 Appendix F Part 1(a)(1)(II), etc.



4/ ref. chapter 5 para 7 (b) J&C Aero EEU would like to suggest that the volume of each cargo area become a requirement implemented in construction design criteria. Cargo class B compartments that fulfil the criteria of Appendix F Part III as well as Part IV and V with sufficient access in flight and smoke detector system would allow the applicant to slightly increase the volume of each cargo loading area resulting in additional space with it's related effects.

EASA response: PARTIALLY AGREED

EASA agrees to consider some wording changes to clarify some of the requirements. However as the special condition will be replaced by a deviation the wording improvements will be part of the deviation.

With respect to the last comment, EASA would like to clarify that installations that are in compliance with the applicable requirements, e.g. full compliant class B cargo compartments, are not subject to this set of special conditions.

Commenter 13: KLM engineering & maintenance – Peter Dol / Head of Airworthiness Office, DOA EASA.21J.012 / 03 July 2020

Comment # 95

Page: 2

Paragraph: “In case an applicant cannot or is not able to demonstrate compliance with this Special Condition or the stringent limitations to the kind of cargo transported in the cabin, a Deviation from the special conditions in Appendix A Chapter A may be proposed and will be assessed by EASA in accordance with point 21.A.101(e)1.(ii)”.

Comment:

The Special Conditional provides the option to deviate from the requirements of the proposed special conditions. However, the proposed Special Condition does not include a specific possibility for re-classification as “Minor Change” by an Approved Design Organization in case the cargo is limited to medical supplies (e.g. masks, gloves, clothing, etc.) that is restrained on passenger seats, as is described in paragraph 5.2.1 of the “EASA Guidelines – Transport of Cargo in Passenger Compartment – exemptions under Article 71(1) of Regulation 2018/1139 (The Basic Regulation) - Issue 4”.

Suggestion:

KLM would like to ask EASA to add the text of paragraph 5.2.1 of the “EASA Guidelines – Transport of Cargo in Passenger Compartment – exemptions under Article 71(1) of Regulation 2018/1139 (The Basic Regulation) - Issue 4” into the Special Condition.

EASA response: NOT AGREED

The “EASA Guidelines – Transport of Cargo in Passenger Compartment – exemptions under Article 71(1) of Regulation 2018/1139 (The Basic Regulation) - Issue 4” were issued to allow a quick reaction to the needs introduced by the Covid-19 pandemic and to provide guidance to the NCA's of the Member States when issuing an Article 71 Exemption.



The proposed set of special conditions was drafted to introduce the possibility of an approval for the transportation of cargo in the passenger cabin without the need for Article 71 Exemption. The two documents are independent and for different purpose.

Comment # 96

Page/paragraph: General comment

Comment:

At multiple locations in the proposed special condition compliance with EASA Certification Specifications is required. The changes to the cabin for transport of cargo, as described in the special condition, should be classified as non-significant changes, because no re-design of the floor structure would be required (refer to GM 21.A.101, Table A-6, Point 9). In accordance with EASA Part 21.A.101(b) for non-significant changes, the certification specifications incorporated by reference in the type-certificate may be used as the certification basis. This would allow an Approved Design Organization to show compliance with the applicable JAR, FAR, or CS requirements.

For example, showing compliance with paragraph 2.2 (page 3) of the proposed special condition, which requires that all materials in the cabin shall at least meet CS 25.853, would be very impractical for airplanes with a JAR or FAR certification basis.

Suggestion:

KLM would like to suggest that EASA includes the option to use the certification specifications incorporated by reference in the type-certificate may be used as the certification basis.

EASA response: NOT AGREED

The set of special conditions was developed for generic use and to establish a minimum safety standard. Most of the existing aircraft do meet the standards set by CS 25.853 as they also have to comply with CS 26.150.

Comment # 97

Page: 3

Paragraph: 2.3

Fire protection – it shall be ensured that the presence of a fire would be timely detected considering all approved operating configurations and conditions.



Page: 7

Paragraph: 2.3

Flight test data may be used to demonstrate compliance with the provisions of the special condition concerning:

- a. The entry of hazardous quantities of smoke or extinguishing agent into compartments occupied by the flight crew or crew in the cabin; and
- b. The dissipation of the extinguishing agent.

Comment:

The proposed special condition requires that flight test data is needed to demonstrate compliance, which may be an economic burden to the industry. However, if there are no persons (no passengers) in the cabin other than professional cabin crew members for the purpose of smoke detection and firefighting, then compliance with this requirement is maintained by the cabin crew due to timely detection of smoke and fire. Furthermore, if the flight compartment door is closed during all phases of flight, then the entry of hazardous quantities of smoke or extinguishing agent into the flight compartment is mitigated.

Suggestion:

KLM suggests that EASA includes in the Special Condition that no additional compliance demonstration with paragraph 2.3 of the special condition would be required, provided that the following mitigating actions are complied with:

1. The flight compartment door is closed during all phases of flight, and
2. There are no persons in the cabin compartment during all phases of flight other than professional cabin crew members for the purpose of smoke detection and firefighting.

EASA response: NOT AGREED

The comment raised is addressing the MoC related to SC 2. The proposed MoC are one acceptable way of demonstrating compliance, but it is not the only way. If appropriately justified other MoC may be acceptable.

Commenter 14: MHIRJ – Isabelle Meunier / Engineering Professional/Airworthiness – 07 July 2020

Comment # 98

In Special Condition, section 1. Allowed Cargo, item 2.b., p.3:

- I do not understand the prohibition against carriage of live animals; this is the normal mode of operation of the cabin. Obviously, appropriate containers would be required. I suggest removing 2.b. or clarifying (e.g. weight limitation).



EASA response: PARTIALLY AGREED

EASA understands that it might be normal to transport live animals in the cabin when accompanied by the passenger and the animal meets certain limitations (e.g. weight or being a medical aid). However, it is not normal to transport large amounts of live animals as cargo in a passenger cabin.

It is understood that the wording can be improved. This will be considered when drafting the deviation.

Comment # 99

In Means of Compliance, section 1. Allowed Cargo, item 3., p.7:

- I do not disagree with the concept but I am concerned about the practicality of including a positive list of items with low fire risk: seems to be too complex to be included in the AFM as a limitation.

EASA response: NOT AGREED

The comment is against the MoC part of the published document. The MoC part is providing guidance how an applicant can comply with the requirements of the special condition. It is not the only possibility.

Comment # 100

In Means of Compliance, section 2. Fire Protection, item 9.d.,p.8:

- We suggest replacing the wording “torch” by “flashlight”. “Flashlight” is used throughout CS25. The wording “Torch” is used in the flammability testing context. If “torch” is the correct requirement for the “Fire Protection” section, please provide definition of “torch”.

EASA response: AGREED

The wording will be improved accordingly.

Comment # 101

In Special Condition, section 4. Emergency escape routes, item 5, p.4:

- This section shall not only be limited to 25.815. It shall also include the passageways and cross aisles required by 25.813.



EASA response: PARTIALLY AGREED

The aircraft that will be used for the transportation of Cargo in the passenger cabin will be limited to “no passenger transportation”. Depending on the placement of the crew in the cabin not all emergency exits may be required. EASA agrees that for the required emergency exits the applicable requirements do apply. This will be clarified in the deviation text.

Comment # 102

In Special Condition, section 4. Emergency escape routes, item 5, p.4:

- Like for seat certification, if 20 inches is kept in section 5.7.c.ii, there should be some allowance for encroachment into the main aisles and cross-aisles like permitted in AC25.562-1B chg 1 Appendix 2.

EASA response: PARTIALLY AGREED

The aisles are a key element for the surveillance and possible firefighting of the cargo. However it is understood that in a post-crash scenario some encroachment into the aisle as permitted by AC 25.562-1B could be acceptable. The SC is addressing the installation of the cargo not the post-crash scenario. A change to the wording is not foreseen.

Comment # 103

In Special Condition, section 5.Cargo loading, item 7.c, p.5:

- *Editorial change:* This section shall be renumbered to “i” (since section 5.7.c start at “ii”). Subsequent lines to be renumbered accordingly.

EASA response: AGREED

The proposed editorial change will be considered when drafting the deviation.

Comment # 104

In Special Condition, section 5.Cargo loading, item 7.c.ii, p.5:

- The unobstructed dimension of 20 inches for the longitudinal aisle width (from floor to ceiling) is unrealistic for regional aircrafts. Our cabin is small and our floor track closer together (i.e. 18 inches apart).
We thus recommend that this dimension be aligned with 25.815 (requirement specified in section 4.5) for cabin with 10 or less passengers. (i.e. 12



inches below 25 inches from the floor and 15 inches for 25 inches and more from the floor)

This is justified by the fact that Regional Aircraft will only be limited to 2 cabin crews. In addition, this is supported by the mitigating fact that each cargo loading zone will be of a volume much smaller than what is prescribed in section 5.7.b. The possible volume of each cargo zone will be physically limited to around 35 cu-ft.

EASA response: NOT AGREED

EASA introduced the 20" requirement to address the firefighting complication (additional equipment must be carried by the crew e.g. smoke hood, gloves, fire extinguisher). Such complications would be the same for smaller and larger aircraft.

Comment # 105

In Special Condition, section 5. Cargo loading, item 7.c.iii, p.5:

- The unobstructed dimension of 15 inches for lateral access fore and aft of each loading area shall be changed to match with the dimensions specified in 25.815 (requirement specified in section 4.5) for cabin with 10 or less passengers (i.e. 12 inches below 25 inches from the floor and 15 inches for 25 inches and more from the floor). This is more realistic with the means of attaching each loading area with cargo nets and straps, in which the net or straps will be angle down to the floor beyond the marked loading area.

EASA response: NOT AGREED

See response to comment #104. The design must provide sufficient access to the cargo for firefighting.

Comment # 106

In Special Condition, section 5. Cargo loading, item 7.c.iv, p.5:

- Consideration for shifting of the each cargo zone under the applicable emergency landing loads shall not be applied to the Fore and Aft access (as required by 5.7.c.iii) apart for passageway or cross aisles leading to emergency exits.
This is justified by the fact that upon an emergency landing, the 1st objective of the occupants onboard the aircraft will be to evacuate the aircraft as fast as possible and not to access around the each loading zone to extinguish a fire.

EASA response: NOT AGREED

See response to comment #105.



Comment # 107

In Means of Compliance, section 6. Electrical Systems, item 3,p.11:

- *Editorial change: "caped", should be "capped".*

EASA response: AGREED

The spelling mistake will be corrected in the final document.

Commenter 15: Transport Canada – Antonio Chiesa / Senior Engineer / Design Standards – July 2, 2020

Comment # 108

Page 3 Heading:

It indicates "Special Condition to CS 25.855 Amdt 24". This is incorrect. Special conditions (Ref. Part 21.A.16B) are applicable to products, not to specific safety standards. Another indication that this is not correct is the fact that the content of the special condition includes product airworthiness requirements for features not covered by CS 25.855, such as, emergency escape routes, oxygen systems, cabin occupants, width of aisles, emergency exits, emergency equipment, etc. Therefore, this is not a special condition to CS 25.855 Amdt 24, but a special condition to prescribe detailed technical specifications due to the lack of adequate or appropriate safety standards in the applicable airworthiness code for approval of a change to the type design of a product or for approval of a supplemental type certificate for a product (large aeroplane) intended to be used to transport cargo in the passenger cabin (Ref. 21.A.16B.(a)2, the intended use of the product is unconventional).

EASA response: NOT AGREED

The valid part 21 reference for this comment would be 21.B.75 based on Regulation (EU) 2019/897. It is correct that a Special Condition is applicable to a product and that it was proposed based on intended unconventional use. This is however not seen in contradiction to the header since the proposed cargo compartment was an addition to the existing cargo compartments as per CS 25.855 at amendment 24.

Comment # 109

Page 3, Introduction:



The statement “In lieu of CS 25.855(a), (b), (c), (d), (h) and (i) the passenger cabin compartment, when used as cargo compartment, shall meet the following special conditions:” is problematic. Does it mean that the paragraphs indicated are exempted? If an exemption is needed it should be provided through a proper exemption.

EASA response: NOT AGREED

Other than bilateral partners, EASA has not the legal means for an exemption that could go below the safety level of the essential requirements in annex II of Regulation (EU) 2018/1139. Therefore, EASA need to consider the technical aspects and their safety impact regardless of the COVID19 pandemic and the corresponding increased public interest in using passenger aircraft as cargo aircraft. A Special Condition that ensure an equivalent level of safety than a Certification Specification based on an unconventional use of a product is in line with part 21.

Comment # 110

Page 3, Item 1, Allowed Cargo:

Except otherwise indicated, the standards of airworthiness in the certification basis of the aeronautical product are still applicable. Item 1 appears to be redundant with the existent CS 25.1525 and CS 25.1583(e).

EASA response: NOT AGREED

EASA finds appropriate to explicitly state what kind of limitations are expected to be included in the AFM to mitigate to an acceptable level the risk of having a catastrophic cargo fire event. The requirement in question is not in contradiction and does not substitute the requirements in CS-25 related to the AFM content.

Comment # 111

Page 3, Item 2, Fire Protection, Sub Item 1:

Except otherwise indicated, the remainder standards of airworthiness in the certification basis of the aeronautical product are still applicable. Item 2 Sub Item 1 appears to be redundant with the existent CS 25.1585(a).

EASA response: NOT AGREED

See answer to comment # 110.

Comment # 112

Page 3, Item 2, Fire Protection, Sub Item 2:



Except otherwise indicated, the remainder standards of airworthiness in the certification basis of the aeronautical product are still applicable. To mention some existent airworthiness standards and not to mention others is confusing. In addition, it is unnecessary to say “at least” when referring to a standard. All standards are minimum standards. Item 2 Sub Item 2 appears to be redundant with the existent CS 25.853.

EASA response: PARTIALLY AGREED

CS 25.855 and 25.857 are the only ones that were intended to be replaced by the Special Condition. All other CS would remain applicable. In regards to 25.853 case, there is no need to list more requirements. In regards to flammability requirements, EASA agrees with the commenter that CS-25 requirements are to be considered as minimum performance standards. However, the intent of the wording is to allow full flexibility in the definition of the standards that materials and constructions must meet when installed in a cabin configured for the transportation of cargo. For example, the fire risk assessment performed by the applicant may indicate that it is appropriate that oxygen systems that are not relocated are protected by a layer of material meeting CS-25 Appendix F Part III standards. In no case EASA is intentioned to allow the flammability standards applicable to cabin interiors to go below the ones prescribed by CS 25.853, hence the use of the expression “at least” is considered as appropriate.

Comment # 113

Page 3, Item 2, Fire Protection, Sub Item 3:

This special condition defines a performance standard that is not measureable. The use of the word “timely” to define the performance of the fire detection function is inaccurate. The level of safety should be the same irrespective of the method of detection employed (smoke detector system compliant with CS 25.858 or cabin crew member detection). Therefore, the applicable requirements of CS 25.858 should be applicable to a cabin crew member detection operation: indication to the flight crew within one minute after the start of a fire, be capable of detecting a fire at a temperature significantly below that at which the structural integrity is affected and the effectiveness must be shown for all approved operating configurations and conditions. Otherwise, the level of safety would not be equivalent to that established in the applicable airworthiness code.

EASA response: PARTIALLY AGREED

The use of the word “timely” in the requirement is addressing the possibility that no fire/smoke detection system is installed in the cabin. If the fire/smoke detection function is provided by the crew members in the cabin it is not meaningful to consider the same quantitative performance standards that are applicable to aircraft systems. Nonetheless, such performance standards are used as a reference to evaluate the procedures that will ensure that the crew members in the cabin can detect the presence of a fire before it can develop to a level that manual fire-fighting is not likely to be effective.

Comment # 114

Page 3, Item 2, Fire Protection, Sub Item 4:



Addressed in comment # 6.

EASA response: PARTIALLY AGREED

EASA finds appropriate to explicitly state that the performance of detectors needs to be demonstrated through testing. The same requirement will be included in the generic deviation.

Comment # 115

Page 3, Item 2, Fire Protection, Sub Item 6:

For clarity, it would be better to replace “the flight crew and any crew located in the cabin” by “all occupants”.

EASA response: NOT AGREED

The proposed wording is clear and explicit

Comment # 116

Page 3, Item 2, Fire Protection, Sub Item 7:

Item 2 Sub Item 7 is duplicated with Item 5 Sub Item 7. Since it is related to cargo restraint and disposition, it would be better to delete it from Item 2 and keep it in Item 5 Sub Item 7.

EASA response: PARTIALLY AGREED

The requirement of Item 2 Sub Item 7 is of generic applicability while Item 5 Sub Item 7 applies to cases in which the cargo items are restrained on the cabin floor. The wording will be improved in the generic deviation.

Comment # 117

Page 4, Item 3, Cabin Occupants:



The document is inconsistent when referring to the areas above floor not including the flight deck. The following terminology is found: passenger compartment, passenger cabin compartment, cabin, cabin compartment. The same terminology should be used everywhere, including the title of item 3.

Further, the document seems to make a distinction between occupants and crew members. It would be useful to include definitions of all related terms, such as: occupant, cabin occupant, additional occupant, required occupant, crew member, required crew member, flight crew member, etc.

EASA response: AGREED

The consistency of the wording will be improved in the generic deviation.

Comment # 118

Page 4, Item 3, Cabin Occupants:

Except otherwise indicated, the standards of airworthiness in the certification basis of the aeronautical product are still applicable. Several Sub Items of Item 3 seem to be redundant with CS 25.1523, 25.1583(d) and Appendix D.

EASA response: NOT AGREED

See answer to comment # 110.

Comment # 119

Page 4, Item 3, Cabin Occupants, Sub Item 4:

Training requirements are not part of CS 25 or are aeronautical product standards of airworthiness. Although the concern with the training of the crew member whose duties are to detect and fight a fire are understandable, an special condition does not seem to be the proper place to define their training requirements.

EASA response: NOT AGREED

Explicit requirements applicable to training of crew members in the cabin are essential to achieve an acceptable level of safety when the transportation of cargo in the cabin is allowed. See also the answer to comment # 110.

Comment # 120



Page 4, Item 6, Cabin Occupants, Sub Item 6:

Pre-flight safety briefing is not part of CS 25 or is an aeronautical product standard of airworthiness. An special condition does not seem to be the proper place. Further, if the occupants are trained, as indicated in Item 3.4, why do they should be given a safety briefing?

EASA response: NOT AGREED

Special conditions mandating pre-flight briefings have been introduced by EASA to address specific features certified for installation on Large Aeroplanes. A relevant example is constituted by the special condition on installation of courier compartments on cargo aeroplane, which include detailed requirements on the content of the pre-flight briefing that flight crew members must deliver to supernumeraries before each flight.

Comment # 121

Page 4, Item 4, Emergency Escape Routes, Sub Item 3:

It is difficult to understand the connection of Sub Item 3 with “Emergency Escape Routes”. In addition, this requirement may make the detection of fire without a smoke detector systems longer than one minute after the start of a fire, what would lead to a level of safety not equivalent to that established in the applicable airworthiness code.

EASA response: NOT AGREED

EASA has decided to include the requirements on separation between cargo areas and areas in which passenger are transported in the section related to emergency escape routes to highlight the intent to protect the occupants to the maximum extent possible from the effects that an emergency landing may have on the transported cargo, including release of shifting of cargo items. EASA would like to clarify that fire/smoke detection must be ensured during all phases of flight, including during taxi, take-off and landing. Therefore the crew members in the cabin are required to occupy seats that provide direct view on the areas in which cargo is transported.

Comment # 122

Page 4, Item 4, Emergency Escape Routes, Sub Item 5:

The width of aisles specified in CS 25.815 is for aisles between seats. Therefore, this Sub Item would only be applicable to configuration where the cargo is transported on seats. It would be better to replace this by a generic (applicable for cargo on seats or floor) prescriptive aisle width specification instead of referring to CS 25.815. Also, when considering Item 5 Sub Item 7.c, looks like a distinction is implied between aisle width specification for evacuation purposes and aisle width



specification for access to cargo and firefighting. I do not think it should be the case. The special condition should make clear that width of aisles is the same for all these three purposes.

EASA response: AGREED

The text of the generic deviation will eliminate the reference to CS 25.815 and will refer to “the minimum aisle width required by the deviation”.

Comment # 123

Page 4, Item 4, Emergency Escape Routes, Sub Item 6:

Floor proximity emergency escape markings is intended to be for passengers (Ref. CS 25.821(e)), which are not as familiar with the aircraft as the trained crew members. When transporting cargo in the passenger compartment there is no passengers.

EASA response: NOT AGREED

While floor proximity emergency escape path marking is expected to provide emergency evacuation guidance to passengers in critical visibility conditions, the system may be beneficial for all cabin occupants, including cabin crew members, whenever they need to travel from one exit area to another. It is therefore considered appropriate to clarify that the system shall not be obscured by cargo items.

Comment # 124

Page 5, Item 5, Cargo Loading:

Cargo Restraint and Disposition would be a better title. Loading may be understood as the action of filling the aeroplane with boxes to be transported.

EASA response: AGREED

In the Deviation, the header will be changed (twice) to “Cargo loading, installation and retaining”.

Comment # 125

Page 5, Item 5, Cargo Loading, Sub Items 2:



The reference to CS 25.789(a) is not correct. That paragraph is applicable only to items of mass that are part of the aeroplane type design. Cargo is not. In addition, the prevention of hazard to occupants/crew member created by shifting cargo is prevented by complying with Item 5 Sub Item 1.

EASA response: AGREED

EASA will revise the text of the requirement to reference CS 25.787(a) instead of CS 25.789(a).

Comment # 126

Page 5, Item 5, Cargo Loading, Sub Items 4:

Why does Item 5 Sub Item 4 only consider emergency landing condition loads? Access to emergency evacuation paths and emergency equipment should not be blocked by any load, including flight and ground loads.

EASA response: AGREED

Flight and ground loads will be added in the Deviation.

Comment # 127

Page 5, Item 5, Cargo Loading, Sub Items 6:

There are two Sub Items 6.

EASA response: AGREED

The text of the generic deviation will be revised to address this comment.

Comment # 128

Page 5, Item 5, Cargo Loading, Sub Items 7.c:

Sub Sub Item “l” is missing.



EASA response: AGREED

The text of the generic deviation will be revised to address this comment.

Comment # 129

Page 5, Item 5, Cargo Loading, Sub Items 7.c:

Sub Item 7.c does not prevent a configuration where the volume of the cargo-loading zone ($< 125 \text{ ft}^3$) is against the outboard sidewall with access only on three sides. Considered the 50 inches maximum height, all boxes below the top layer in the outboard side away from the periphery are inaccessible. Manual firefighting would not be possible or very difficult if the seat of the fire is on any of those boxes. Limiting the height to 50 inches (4.16 ft) and the volume to 125 ft^3 would allow a rectangular prism shape measuring 4.16 ft x 5.5 ft x 5.5 ft. Unless it is demonstrated by test, I would not consider this an appropriate access to the cargo for manual fire fighting purposes and equivalent in level of safety to that established in the applicable airworthiness code.

EASA response: NOT AGREED

The limitations to the volume and height of each cargo area, combined with the presence of longitudinal and transversal corridors ensure that a fire fighter has access to at least three sides of the cargo area, and is not further from the fire location than in the entrance of a Class B cargo compartment meeting the dimensional criteria of AMC 25.855 and 25.857.

Comment # 130

Page 5, Item 5, Cargo Loading, Sub Items 7.d:

Ventilation is accomplished by air being inserted and removed from an environment. Therefore, neither the air inlet nor the air outlet (exhaust) should be obstructed.

EASA response: AGREED

Text is modified accordingly.

Comment # 131



Page 6, Item 6, Electrical Systems, Sub Items 1:

Only unnecessary electrical system shall be deactivated. Suggest change to:

Unnecessary electrical systems and equipment, including installed in cabin areas in which cargo is transported shall be deactivated, removed, protected, relocated, or manipulated in a way that they do not cause an additional fire risk.

EASA response: PARTIALLY AGREED

EASA agrees with the intent of the comment but will not introduce the text change proposed by the Commenter.

See answer to comment #7.

Comment # 132

Page 6, Item 7, Oxygen Systems, Sub Items 1 and 2:

These Sub Items assume crew member in the passenger compartment are not co-located with the cargo. As mentioned before, this may make the detection of fire without smoke detector systems longer than one minute after the start of a fire, what would lead to a level of safety not equivalent to that established in the applicable airworthiness code.

EASA response: NOT AGREED

See answer to comment #121.

Comment # 133

Page 6, Item 7, Oxygen Systems, Sub Items 3:

This Sub Item is not related to oxygen systems. Instead, it is related to public address system. Maybe it would be better to move it under Item 6, Electrical Systems. This is an example of an electrical system that is necessary and shall not be deactivated.

EASA response: PARTIALLY AGREED

EASA agrees that the requirement should be relocated in a different section of the special conditions. However, EASA has determined that the requirement will be included in the section related to occupant safety rather than in the Electrical Systems section.



Comment # 134

Transport Canada notes that the proposed SC from EASA does not provide for an effectivity date time expiry. This is inconsistent with EASA's previous published Guidelines which indicated that the temporary allowance to transport limited types of cargo in the passenger compartment would be only be in effect until about 8 months after issuance of those Guidelines - thus - about December, 2020. Since the proposed SC states that the passenger compartment does not meet the cargo compartment certification specifications, it is not clear as to how this proposed SC can continue beyond the emergency requirements directly related to the COVID-19 pandemic. At present, most Authorities are looking at an end of 2020 expert for this temporary use of the passenger compartment

EASA response: AGREED

EASA has determined that the originally proposed certification approach based on special conditions could have the potential to generate inconsistencies between projects. The complexity and the criticalities associated to the performance of a fire risk assessment could create the conditions for applicants to underestimate the hazard associated to a cargo fire. EASA will therefore publish a generic deviation imposing a limitation expressed in flight hours or a time interval, whichever occurs first, in order to mitigate to an acceptable level the risk of exposure to a catastrophic cargo fire event. See also answer to comments #35 and #73.

Comment # 135

Transport Canada notes that the proposed SC refers to CS 25.855 at Amendment 24. Although it is understood that the proposed SC needs to refer to a CS reference, it is unclear how this affects aeroplanes where their certification basis is not updated to Amendment 24. The wording in CS 25.855 may have changed through the various amendments to the CS 25. As a result, direct references to CS 25.855 in the proposed SC may not align with the certification basis for all aeroplanes. This may be cause for questions by applicants and it is not clear as to how this would be addressed in the proposed SC, or referenced to other documents

EASA response: AGREED

The SC was published based on the latest CS 25 amendment. It is true that the content might be adapted depending on a specific application which would however not change the intended safety level. For the related requirements, if compliance with a specific amendment of a requirement is necessary, this shall be clearly stated. Otherwise the TCDS levels for each product apply.



Comment # 136

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 2 - only identifies CS that relates to cargo compartment design. The proposed SC only refers to CS 25.855 and 25.857. Although these are specific to cargo compartment design, they are not the only CS to impact cargo compartment, or related fire protection systems, designs. It is recommended that this wording be change to provide clarity that many other CS specifications also apply to cargo compartment design and that 25.855 and 25.857 are only 2 related specifications.

EASA response: PARTIALLY AGREED

See answer to comment #112.

Comment # 137

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 3 - states that the design of the passenger compartment does not meet any of the cargo compartment class definitions. This appears quite clear. However, feedback from the aviation industry seems to indicate that some think that the passenger compartment could be classified as a Class A cargo compartment. Based on this thinking and the typical description of the Class A cargo compartment - small stowage area readily accessible to the flight crew at their normal seated positions - this statement may need to be expanded to also specifically state that the passenger compartment does not meet Class A through F cargo compartment classifications as well as the references to CS 25.857.

EASA response: AGREED

The text of the generic deviation will consider this comment and highlight that the passenger cabin cannot be classified as Class A or Class F cargo compartment.

Comment # 138

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 3 - states that the “...Furthermore it is assumed that passengers and crew members can timely detect cabin fires.” This does not state the complete objective. It is recommended that the wording be expanded to include - “...Furthermore it is assumed that crew members can rapidly detect and locate cabin fires, and that the crew members can rapidly and fully extinguish the fire in the passenger compartment.” The rapid and full extinguishment of the fire is an important aspect with respect to any fire in the passenger compartment. It is also an important aspect to the justification of this proposed SC. No credit should be given to the passengers detecting either smoke or fire and making the crew members aware of this situation.



EASA response: AGREED

The text of the generic deviation will consider this comment.

Comment # 139

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 4 - only identifies CS that relates to cargo compartment design. The proposed SC only refers to CS 25.855 and 25.857. Although these are specific to cargo compartment design, they are not the only CS to impact cargo compartment, or related fire protection systems, designs. It is recommended that this wording be change to provide clarity that many other CS specifications also apply to cargo compartment design and that 25.855 and 25.857 are only 2 related specifications. The examples provided in this paragraph relate to many other CS specifications.

EASA response: PARTIALLY AGREED

See answer to comment #112.

Comment # 140

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 5 - only identifies CS that relates to cargo compartment classifications of Class C, E or F. Class B cargo compartment is missing from this list. It is not clear as to why Class B is not mentioned. Does this mean that EASA will not consider Class B for this proposed SC ?

EASA response: AGREED

The text of the generic deviation will consider this comment and highlight that the passenger cabin cannot be classified as Class B cargo compartment.

Comment # 141



Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 5 - lists the main aspects which the proposed SC addresses. One critical aspect that is missing or not emphasized enough is that of the need for required access to all sides of the cargo in the passenger compartment to ensure that crew members can rapidly detect smoke or fire, and fully extinguish the fire for the continued safe flight of the aeroplane.

EASA response: NOT AGREED

Requiring access to each cargo area from all sides would result in prohibiting installations with cargo adjacent to a bulkhead or to cabin sidewalls. It would also be incompatible with the use of cargo seat bags on outboard seats. EASA finds that providing access to cargo areas from three sides out of four, together with stringent limitations to cargo height and volume, ensures sufficient access for effective firefighting. See also answer to comment #129.

Comment # 142

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 5 - uses the words - "...through the introduction of severe restrictions on the type of cargo ...". When reading the proposed SC - Section 1 - Allowable Cargo - and the related AMC Section 1 which provides more detail - it is not clear as to EASA's expectation for Allowable Cargo. If EASA's expectation is that the proposed SC is to allow the transport of cargo in the passenger compartment only when this cargo is determined to be non-flammable as the means to minimize the additional fire threat to the aeroplane and its crew, then EASA should clearly state that expectation in Section 1 of the proposed SC. If this is EASA's expectation, then would non-flammable also apply to the packaging of the cargo? Perhaps the expected fire threat needs to be more clearly identified throughout the proposed SC and the related AMC.

EASA response: PARTIALLY AGREED

The generic deviation will include a definition of non-flammable cargo. In order to maintain the level of flexibility typical of cargo operation, the equipment used to restrain cargo, as well as the packaging, will not be required to meet that definition.

Comment # 143

Transport Canada notes that the proposed SC - in Identification of Issue - paragraph 6 and 7 - state that if the proposed SC conditions cannot be met, then a Deviation can be applied for. Although EASA identifies 21.A.101(e)1.(ii), it is not clear if the Deviation is expected to be restricted to include a time limit on its effectivity - in other words - a time expiry date. Several criteria are mentioned in paragraph 7 but not a time expiry date. If this is correct, then this is a significant difference to the proposed SC and should be clarified.



EASA response: : AGREED

See answer to comment #134.

Comment # 144

Transport Canada notes that the proposed SC - Section 2 - statement 2 - only identifies CS 25.853. EASA does not specify the Amendment level for this reference. As the proposed SC is referring to Amendment 24, is this reference also to Amendment 24? This is actually a general comment as to the intended references and their Amendment levels throughout the proposed SC. Consistency of Amendment level should be clear in the proposed SC.

EASA response: AGREED

See answer to comment #135.

Comment # 145

Transport Canada notes that the proposed SC - Section 2 - statement 4 - states that the performance must be demonstrated, however, there is no reference to means of compliance. Is the EASA expectation that this will be demonstrated using current guidance and AMC material? These referenced materials may vary depending upon the aeroplane type and certification date.

EASA response: AGREED

In the generic deviation it will be clarified that AMC 25.858 can be considered applicable to demonstrate the performance of any fire/smoke detection systems.

Comment # 146



Transport Canada notes that the proposed SC - Section 2 - statement 9 - states that the CS specification relates to built-in fire extinguishing systems. However, the direct applicability of this is unclear. The firefighting procedure for the transport of cargo in the passenger compartment will be manual firefighting with portable fire extinguishers. It is the point of the fire extinguishing system having to flood both compartments that is unclear.

EASA response: AGREED

The proposed special conditions were compatible with multiple strategies to suppress/extinguish a cargo fire in the cabin: manual fire-fighting, built-in fire suppression system or depressurisation. On the contrary, the generic deviation will assume that manual fire-fighting is the only available means to suppress/extinguish a cargo fire in the cabin.

Comment # 147

Transport Canada notes that the proposed SC - Section 3 - statement 1 - does not state a minimum number of additional crew members whose responsibility it is to monitor the cargo, detect smoke or fire, and fight the fire. The minimum number of crew members for operational safety reasons should be stated as 2 and additional crew members may be required depending upon the cargo load - type and volume - and the type of aeroplane and planned flight operation. Any additional crew members required by the risk assessment should be directly related to the planned flight operation. “Additional occupants” not related to the planned flight operation should not be allowed due to the inherent change in the fire threat when transporting cargo in the passenger compartment. As these operations also have a “no passengers” limitation, the additional occupants would need to qualify as crew members.

EASA response: AGREED

The text of the generic deviation will consider this comment and better clarify that only crew members and no passengers are allowed in the cabin.

Comment # 148

Transport Canada notes that the proposed SC - Section 3 - statement 9 - does not state an expectation of a minimum time period for cargo inspection. During the Cabin Safety Working Group discussions, emphasis was placed on the need for rapid detection of smoke or fire by the crew members and that this would require very frequent inspections of the cargo to ensure early detection, and rapid extinguishment of the fire for the safe operation of the aeroplane.

Use of the term - “...regular basis...” does not convey the expected need for very frequent inspections and the significance of the fire threat potential should the inspections not be carried out in a timely manner.



Transport Canada recommends that the wording be changed to emphasize the expectation that the inspection intervals need to be accomplished on a very frequent and regular basis commensurate with the foreseeable fire threat. This fire threat is also dependent upon the individual type of cargo, cargo volumes, type of aeroplane, and type of flight operation.

EASA response: AGREED

The text of the generic deviation will consider this comment and specify the minimum frequency considered acceptable for cargo inspections.

Comment # 149

Transport Canada notes that the proposed SC contains an inconsistency between the required access aisle dimensions in Section 4 and Section 5.

Specifically, Section 4 - statement 5 - refers to CS 25.815. This results in a variable access aisle dimension based on passenger capacity. The overall intention is that the cargo volume be readily accessible on all sides to ensure effective in-flight inspection and firefighting or at least on 3 sides if the cargo volume is adjacent to a sidewall area provided the sidewall does not adversely affect smoke / fire detection or firefighting. As discussed in the Cabin Safety Working Group, a minimum access aisle width should be stated as 15 inches at all heights from the floor to the ceiling of the passenger compartment including accounting for cargo shifting during ground or operations and emergency landing conditions. The reference to CS 25.815 is inconsistent with the discussions in the Cabin Safety Working Group and Section 5 of the proposed SC.

In addition, Transport Canada notes that the proposed SC - Section 5 - statement 7 c. - refers to the access to the cargo. It should be clear that the access aisle is required on all sides of the cargo and not limited to the stated longitudinal and lateral access aisle configurations. In the case that the cargo could be located in the passenger compartment so that one side of the cargo is adjacent to a sidewall or an existing interior furnishing - for example - a windscreen, or a row of seats, etc., then, the cargo volume should be required to be accessible on at least 3 sides and that there will be adequate space to the sidewall, or interior furnishing, so as not to adversely affect smoke / fire detection or firefighting activities.

From the Cabin Safety Working Group discussions, it was evident that the early discussions about minimum aisle widths were focused on wide body aeroplane configurations and were not adequately accounting for smaller narrow body aeroplane configurations where the prescribed aisle widths may not be achieved in the fully certified passenger configurations.

EASA response: AGREED

See answer to comments #122 and #129.



Comment # 150

Transport Canada notes that the proposed SC - Section 5 - statement 7 d. - refers to ventilation exhausts. This statement is limiting. This should refer to air conditioning system air flow pathways including ventilation inlets, ventilation exhausts, decompression panels, etc.

EASA response: AGREED

Text is modified accordingly.

Comment # 151

Transport Canada notes that the proposed SC - After Section 7 - does not address the need to ensure that the cargo loading does not adversely affect the protection of systems - critical, essential, or emergency - in the aeroplane wherever they are routed through, or installed in, the passenger compartment. This is a normal design requirement for cargo compartments and directly relates to the safe operation of the aeroplane under normal conditions including ETOPS type operations, emergency conditions, etc. Consideration of this aspect should be mentioned in the proposed SC.

EASA response: PARTIALLY AGREED

EASA agrees with the intent of the comment. However EASA finds that the special conditions and the related MOC section adequately highlight the need to protect aircraft systems from the shifting of cargo, from the effects of a cargo fire and from damage during the loading/unloading of cargo. See also answer to comment # 26.

Comment # 152

Transport Canada notes that proposed SC is published by EASA for public consultation. The Means of Compliance is published for awareness only and not for public comment. Transport Canada notes that any changes to the proposed SC from the public consultation may impact the Means of Compliance Section as it provides significantly more data as to support the application of the proposed SC.

EASA response: AGREED



The MOC section will be adapted as appropriate and integrated in the text of the generic deviation.

Comment # 153

Transport Canada notes that the proposed SC - Section 5.1- There are no provision for inspections of attachment points in the event, for instance, if strap loads are exceeded. The seat tracks / beams could be compromised as a result of excessive loading.

Note that in the MoC section, the only time an inspection is raised is if passenger doors are damaged (p 11 of 12)

EASA response: PARTIALLY AGREED

Although it is recognized that excessive strap loads could compromise seat tracks / beams, it is felt that appropriate installation instructions and adequately trained personnel should address this concern.

Comment # 154

Transport Canada notes that the proposed SC - Section 5.3- It should be emphasized that included “additional forces” should not introduce unintended alternate load paths in the floor structure.

Note that in the MoC section, 5.1.e (p. 10 of 12) there is a sentence that states: “...Large pallets attached on multiple seat track locations should not alter significantly the aircraft floor stiffness. This would imply that unintended alternate load paths may be introduced.

EASA response: AGREED

In the Deviation, item 5.1.e will be expanded by adding “...and should not introduce unintended alternate load paths in the floor structure.”

Commenter 16: umlaut engineering GmbH, Dominik Kreutzer, Chief of the Office of Airworthiness EASA.21J.469, 03.07.2020

Comment # 155



General

The introduction stipulates “the proposed designs will change the passenger compartment into a cargo compartment”. This indicates the cabin compartment can either be passenger or cargo compartment. The SC should also address hybrid solutions of passenger cabins hosting both passengers and dedicated cargo units. Furthermore, it only addresses cargo in seat bags or cargo on the floor (e.g. on pallets or directly on the floor).

It should also consider dedicated cargo units (e.g. cabin cargo trolleys, which can be fixated to the floor structure), of course with further requirements.

EASA response: NOT AGREED

EASA has determined that the transportation of cargo in the cabin can be allowed only through a deviation from the requirements of CS 25.855 and 25.857. The level of safety that can be achieved through the deviation is not considered sufficient to allow transportation of cargo and passengers in the cabin in the same flight. See also answer to comment #134.

The installation of cargo on the floor is addressed by EASA in a generic manner, so that different design solutions may be pursued by applicants.

Comment # 156

Section 1) Allowed Cargo

ad 2: Transportation of Dangerous Goods and Live Animals should not be prohibited per se, but should be subject to the operator approval according to CAT.OP.MPA.160, CAT.GEN.MPA.20 or similar and a fire risk assessment.

EASA response: NOT AGREED

See answer to comment #134.

Comment # 157

Section 3) Cabin Occupants

ad 3: See comment #1: Hybrid cabin (transportation of both passengers and cargo) should not be excluded per se.

EASA response: NOT AGREED

See answer to comment #155.

Comment # 158

Section 3) Cabin Occupants

ad 8: See comment #1: The use of portable oxygen in a hybrid cabin should be addressed in the substantiation, taking into account dedicated cargo or passenger areas and the distribution of emergency equipment such as PBEs, fire extinguishers and portable oxygen.

EASA response: NOT AGREED



See answer to comment #155.

Comment # 159

Section 4) Emergency escape routes

ad 4: See comment #1: Hybrid cabins with dedicated areas for cabin cargo trolleys and passengers. Evacuation analysis to be performed similar to passenger only cabins.

EASA response: NOT AGREED

See answer to comment #155.

Comment # 160

Section 5) Cargo loading

ad 7: a) max height 50in: Please clarify where this requirement is derived from or which purpose it fulfils (derived from 5.5?). This should not be limited as long other requirements (ventilation, inspections etc.) are not compromised.

EASA response: NOT AGREED

The height of the cargo from the floor is explicitly limited to facilitate monitoring of the cargo areas by crew members in the cabin occupying existing cabin attendant seats during taxi, take-off and landing. The approach is based on taking credit from the direct view capability that such seats offer based on CS 25.785(h)(2).

Comment # 161

Section 5) Cargo loading

ad 7: b) Please define cargo loading area: Cargo volume per pallet (per loading device) or cargo area in the aircraft with several pallets or cargo devices next to each other?

EASA response: AGREED

The generic deviation will include a clearer and more consistent wording.

Comment # 162

Section 5) Cargo loading

ad 7: c iii) see comment 7. Lateral access should be a recommendation, not a requirement. If it can be shown that the cargo containers can be accessed appropriately from the aisle and firefighting from outboard is not required, the minimum distance should not be mandatory.

EASA response: NOT AGREED



See answer to comments #129 and #141.

Comment # 163

Section 6) Electrical systems

ad 1: see Comment #1, hybrid cabins. There should be no limitation of the regular usage of installed electrical systems.

EASA response: NOT AGREED

See answer to comment #155.

Commenter 17: Expleo Germany GmbH – Konrad LEHMANN-VON WEYHE / Head of Office of Airworthiness / EASA.21J.657 – 07 July 2020

Comment # 164

Re: Page 5, section 5., sub-section 7, item c. ii

a) The limit of a 20" aisle is difficult to achieve when this requirement is also valid at floor level. As per the guidelines for NAAs (Issue 04, dated on the same day as this SC), empty passenger seats are required as "barriers" between cargo and the seats reserved for occupants (such as members of the crew responsible for fire detection and firefighting). If this is a requirement in the guidelines for NAAs, then this same safety rationale should be acceptable for this SC. When installing (or leaving installed) passenger seats, the remaining aisles between such seats are usually min. 15" wide at floor level and min 20" wide from 25" above the floor.

Furthermore, the guidelines for NAAs at issue 03 called for a minimum width IAW 25.815. Due to the low number of occupants, this would result in a 12" (floor level) / 15" (25" above floor) aisle. Please clarify what led to this change in requirements from guidelines Issue 03, to Issue 04 to SC – all should provide a level of safety to allow NAAs to issue exemptions for up to 8 months under Article 71 (1). Why would an operation for longer than 8 months require such a significant increase in access for firefighting?

b) The requirement to require upright walking along the aisle is very hard to achieve in regional turboprop aircraft, when making reasonable use of the available cabin volume. Expleo holds an STC and has successfully shown compliance for a design in which the cargo attendants can't walk upright but have a 20" aisle (slightly slanted) up to 200cm height.

Expleo suggests the following change to the wording:

- ii. A longitudinal aisle(s) *meeting the minimum width dimensions specified in 25.815 for aeroplanes with a seating capacity of 20 or more passengers.* ~~width of at least 51 cm (20").~~ Each longitudinal aisle shall enable a crewmember to traverse it while *maintaining a comfortable posture walking upright.*

EASA response: NOT AGREED

See answer to comment #104.



Comment # 165

Re: Page 5, section 5., sub-section 7, item c. iii

Typographical error involving a crucial limitation of the SC: 30cm = 11.81" \approx 12"

Please confirm the following corrected wording:

- iii. A lateral access fore and aft of each loading area of at least 30 cm (**12"**) wide.

EASA response: PARTIALLY AGREED

The correct minimum width of the lateral corridors is 38 cm (15 inches). The same requirement is included in issue 4 of the EASA 'Guidelines on transport of cargo in passenger compartment – Exemptions under article 71(1) of Regulation 2018/1139 (The Basic Regulation), dated 9th June 2020. The text of the proposed deviation will be updated accordingly.

Comment # 166

Re: Page 12, MC section 3., sub-section 3

Assessment of maximum temperature to be expected in the PSU due to a fire developing in the cabin. Assuming the use of a "positive list" (IAW MC to SC, section 1., subsection 3) and assuming that only non-flammable items are permitted and content of cargo has been controlled, the temperature assessment becomes obsolete. Non-flammable cargo and no added sources of ignition when compared to regular passenger operations should not result in a constellation that would result in a higher risk for inadvertent oxygen generator discharge from the PSU than during normal passenger ops. During regular passenger ops, a fire may well occur in conjunction with a loss of cabin pressure, leading to release of oxygen masks and/or oxygen. Furthermore, during normal passenger ops, the cabin attendants would be very likely to respond much slower to a fire than dedicated cargo attendants during cargo ops.

Expleo suggests the following change to the wording:

3. For decentralized oxygen systems, gaseous or chemical, the applicant should either remove the passenger oxygen system, or assess the maximum temperature to which the PSUs could be subject in case of fire developing in the cabin, *unless the applicant can show that the likelihood of a fire in the cabin is lower than during passenger operations.*

EASA response: PARTIALLY AGREED

*The transportation of low fire risk cargo in the cabin was expected as an essential aspect of the compliance approach with the proposed special conditions. EASA has determined to issue a deviation that will replace the proposed special conditions.
See answers to comments #35, #73 and #134*



Comment # 167

Formal comments:

- a) Numbering on page 5, section 5: subsection 6 appears twice
- b) Numbering on page 5, section 5: subsection 7, item c. / i. seems to be missing, only ii, iii & iv exist.
- c) Page 7 – Should the title be “Acceptable Means of Compliance”, since the applicant should be able to demonstrate compliance to the requirements of the SC through other means as long as the intent of the main document (pages 1-6) is met and EASA agrees on the specific solution.

EASA response: PARTIALLY AGREED

EASA has determined to issue a deviation that will replace the proposed special conditions.

See answers to comments #35, #73 and #134. The corrections proposed by the commenter have been taken into account in the definition of the content of the proposed deviation.

