EASA Proposed CM-S-002 Issue 01 – Application of CS 25.561 (c)(2) 1·33 'Wear and Tear' Factor – Frequent Removal of Interior Structures - Comment Response Document

Comment				Comment summary	Suggested resolution	Comment is an observation or is a suggestion	Comment is substantive or is an objection	EASA comment disposition	EASA response
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1	*Dassault Aviation*			Dassault Aviation appreciates the possibility offered by EASA to provide comment on proposed CM –S-002 "Application of CS 25.561 (c)(2) 1·33 'Wear and Tear' Factor – Frequent Removal of Interior Structures". Dassault Aviation would appreciate below remark to be considered. By engineering judgment, at least one removal every flight or every month qualifies as "frequently removed". Thus, "wear and tear" factor of 1.33 will be applied when expected removal occurrence is superior to every flight or every month.				Partially Accepted	EASA reminds applicants that CMs are raised to '*provide guidance on a particular subject and, as non-binding material, may supplement current standards',* e.g. support rule and AMC material. Therefore, the scope for 'engineering judgement' remains open, as also indicated in the final paragraph of par.3.1. In this case, as indicated in the CM*,* the purpose of providing further examples is *to make* clear that the 1.33 applies to more than the 'quick change' example provided in the current 25.561(c)(2) rule. Regarding the specific comment addressing removal at a frequency greater than once per month, EASA agrees that the CM would benefit from addition of a time based criteria. However, further to similar comments and further review of industry practice, EASA considers changes at a frequency greater than once per year to be more appropriate, see also response to comment nr 8 below.
2	*Jet Aviation AG*	3.1		Jet Aviation Basel have the following comment to the above noted Certification Memo. Para 3.1 provides some example circumstances when it will be the policy of EASA to apply the 1.33 wear and tear factor, particularly in the post TC modification market. EASA are correct that more recent TC designs from the OEMs introduce flexible/adaptable zones that make quick changes possible, with particular note of monuments and attaching fittings using quick release pins. We note EASA's acknowledgement that the included examples are not all inclusive and that engineering judgement is still required in its application in conjunction with the definition of the term "frequent". In limited lines of business for private category operation, some customized interiors will maintain the utilisation of the new OEM attachment principles as part of interior outfitting STCs, although will not be intended for frequent removal on the grounds of adaptation or access. Further adaptation of these interiors would be controlled through additional STC application, despite the possibility of quick removal/attachment methodology by virtue of their design. Global application of the wear and tear factor at these types of installations would lead to significant weight increases in circumstances where weight reduction is a premium, and additionally impact on interface load values without benefit from any increase in safety. On this basis we request that the element of discretion remains open for negotiation in limited circumstances so as not to mandate the application of the 1.33 factor, through discussion and agreement with the authorities, for circumstances where the intent is clearly not in line with the permitted functionality of the design.				Noted	EASA reminds applicants that CMs are raised to '*provide guidance on a particular subject and, as non-binding material, may supplement current standards'* e.g. support rule and AMC material'. Therefore, the scope for 'engineering judgement' remains open, as also indicated in the final paragraph of par.3.1. As indicated in the response to comment nr 3, the CM does not intend to require the use of further factors on top of existing manufacturers designs intended to address similar use. This requires that communication of these design criteria be clearly provided by manufacturers or modification organisations.

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3	*Boeing Commercial Airplanes*	Section 2. Background	5	It is understood by the information in the Background that a need has emerged to address the "1.33 wear and tear" factor. This is indicated by the increasing appearance of interiors that are designed to ease configuration changes, the lack of standardization in compliance with CS 25.561(c)(2) in STCs, and the expectation for damage as a result of increased equipment change. The proposed advisory material offers additional information to allow engineering inspection for features likely to be changed. We recommend that the areas intended for quick change should be made more clear and identified by the design organizations that produced such equipment.	In addition to clarifying the use of 1.33 wear and tear factor, we request that EASA also specify that airframe makers and modification services specify which equipment items are intended by design for in-service relocation/reconfiguration and which are not, perhaps by indicating this in the Component Maintenance Manual or a proposed Interior Reconfiguration Guide. This would provide information both for the operator and subsequent modification shops to know when 1.33 is applicable to the attachments, or when to account for wear and tear if an interior item will be re-purposed to be "quick change."	Yes		Accepted	EASA agrees that the intent of the proposed amendment will be beneficial for future designs and will amend the policy accordingly. However, EASA must not forget the existing fleet that does not benefit from such clear information.
4	*Boeing Commercial Airplanes*	Section 3.1. EASA Policy	6	The proposed EASA Certification Policy is listed with five bulleted statements, describing the types of structure to which the policy may apply. The first bullet addresses structure: "...designed for 'quick change' (per the original example provided in the requirements), which makes possible rapid changes, e.g., frequent overnight changes, seasonal changes, etc., between cargo and passenger configurations using palletised seats, cargo nets, etc. Such changes are of particular concern in the post TC modification market for existing airframes, when particular care is also required regarding the determination of the original design assumptions at the intended modification attachment locations;" Regarding this bullet, we offer the following suggestion: Airframe makers design equipment to install easily and quickly into airframes. This reduces production cycle times, and uses attachment features to expedite production work, yet is intended for a single installation occurrence. Once the aircraft is delivered to an operator, the item will remain in place until a heavy maintenance check. There are also equipment items intended by design for quick relocation or reconfiguration, or are removed for some necessary access, which should have the wear and tear factor applied to the attachments. However, this distinction in design use has not been made clear in the proposed guidance, and the wear and tear requirement has been viewed as applicable whenever a simple quick release attachment device is used.	To avoid confusion that may lead to unnecessary weight increases to airframes for designing 1.33 capability everywhere based solely on fitting type, we suggest EASA add the following additional clarifying statement after the initial statement that end in "…cargo nets, etc.": **"The consideration is specific to interior designs that were provided to enable the operator quick in-service relocation or reconfiguration of specific equipment, or quick access through equipment removal, and which may not be identified by fitting type alone."**		Yes	Partially Accepted	EASA has slightly amended the bullet point to capture the intent of the comment. However, EASA believes that the issue is addressed by the second bullet point and the associated responses to the comments.
5	*Boeing Commercial Airplanes*	Section 3.1. EASA Policy	6	The third bullet addresses structure: "...likely to be changed/moved at a frequency equal to or greater than the frequency of typical local seat changes/movements." Phrasing such as "likely to be changed" does not provide clear understanding, but increases uncertainty, as the applicant must assess the degree of "likely to be changed."	We suggest replacing the phrase "... likely to be changed ..." with the following: **"... intended for available quick relocation or reconfiguration ..."** Our suggestion notes the design purpose and avoids probabilistic considerations.		Yes	Accepted	Text amended accordingly.

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6	*Boeing Commercial Airplanes*	Section 3.1. EASA Policy	6	The fifth bullet addresses structure: *"likely to be removed locally on an 'ad hoc' basis, e.g., overhead bins with quick release pins. This is particularly important if such removal is likely to occur uncontrolled/unrecorded due to ease of removal providing an attractive practical alternative solution to an approved access route."* This apparently asks that the airframe or modification shop design organizations anticipate unauthorized removal activities, performed by operators or their maintenance staff at a frequency typical of local seat changes (from prior bullet.) Anticipating uncontrolled conditions for incorporating wear and tear protections makes this proposed guidance particularly broad and general and, as such, may not reduce the lack of standardization of compliance with CS25.561(c)(2) in STCs or at airframe companies. The second and fourth bullets, when carefully considered, should cover designs and procedures needing ease of access without considering "ad hoc" conditions.	In light of the guidance information in the prior bullets, we suggest that this fifth bullet be deleted as too broad and unspecific.		Yes	Partially Accepted	EASA understands the potential of the comment. However, the intent of the bullet was to encourage the transfer of practical operating experience, which in some cases could be more appropriate than the air framer experience, from previous similar installations to new design (primarily for STCs). Text revised to encourage this point.
7	*Airbus SAS*	§3.1	7/7	The statement on top of page 7/7 "Note: The 1·33 factor is considered appropriate for all attachments of items of mass > 0,45 kg (1lb) likely to experience frequent removal (> 0,15 kg (1/3lb) if attached to a seat) and all safety equipment mountings (PBE, Fire Extinguishers, Oxygen Bottles, etc.)." does not clearly restrict the 1.33 factor to items of wear and tear which is the scope of CS 25.561 (c)(2). As written, it seems to extend to any structure. Airbus position is that quoting masses quantitatively is too restrictive.	Airbus proposes to change the change the text to read (deletions marked by strikethrough, additions underlined): "Note: The 1·33 factor is considered appropriate for all attachments of <u>interior</u> items ~~of mass~~ subject to wear and tear which have <u>a considerable</u> mass ~~> 0,45 kg (1lb) likely to experience frequent removal (> 0,15 kg (1/3lb) if attached to a seat)~~ and all safety equipment mountings (PBE, Fire Extinguishers, Oxygen Bottles, etc.)."	Yes	Yes	Partially Accepted	EASA considers the CM title to be adequately clear in conjunction with the final text to not require repetition of reference to CS25.562(c)(2). EASA agrees that the addition of the word 'interiors' is appropriate. EASA considers that the current inconsistency regarding interpretation of the current requirements at STC or use of the word 'considerable', as proposed in the comment, to remain too open to interpretation. Therefore, EASA prefers to state thresholds for the purposes of standardisation which are defined at levels either common with existing guidance material or guidance from EASA Cabin Safety Section.
8	*Airbus SAS*	§3.1	6/7	The CM does not define what is "frequent" (which is a key judgement, whereas "mass" limit is proposed). As an internal guidance, Airbus has developed a "Stress Policy" to define the term "frequent".	Airbus proposes to add to the CM as an additional bullet in § 3.1: "For attachments not subject to frequent removal: An item that is removed less than once per year is not regarded as frequent removal"	Yes	Yes	Accepted	Further to related comments, see comment nr 1, and internal EASA discussion, it is agreed that the CM would benefit from addition of a time based criteria. A frequency greater than once per year would seem appropriate. However, the text is also amended to point out that some installations in more challenging environments may justify retention of the 1.33 even if removed less frequently than once per year, e.g. the corrosive environment local to galleys and toilet floor attachments. Text amended accordingly.
9	*Airbus SAS*	§3.1	6/7	As an internal guidance, Airbus has developed a "Stress Policy". The current Airbus stress policy includes a provision saying: "No wear and tear attachment factor (1.33 factor per CS25.561) has to be used:...For commercial furnishing interfaces (toilets, galleys, partitions, etc.). Those items are not considered as frequently removable and so, wear and tear considerations are not applicable in this case:..."	Airbus proposes to add to the CM as an additional bullet in § 3.1: "For attachments not subject to frequent removal: An item that is removed less than once per year is not regarded as frequent removal".	Yes	Yes	Accepted	Repeat of above comment and response.

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10	*Airbus SAS*	§1.1	4/7	As an internal guidance, Airbus has developed a "Stress Policy". The current Airbus stress policy makes the assumption that "toilets, galleys, partitions" are not considered as frequently removable and so, wear and tear considerations are not applicable in this case.	Airbus proposes to change the text to read (deletions strikethrough): "This Certification Memorandum provides guidance on the application of the 1·33 'Wear and Tear' factor applied to inertia forces for interior structure/item of mass attachment fittings (including seat rails), as required by CS 25.561 (c)(2) for large items of mass, ~~e.g. galleys, closets, lavatories, class dividers, etc.~~ which may be frequently moved and which, if they became loose, could directly, or indirectly, threaten occupant safety.	Yes	Yes	Not Accepted	See response to comment nr 8.
11	*Airbus SAS*	§3.1	6/7	As an internal guidance, Airbus has developed a "Stress Policy". Current Airbus stress policy includes the provision saying that… "No wear and tear attachment factor (1.33 factor per CS25.561) has to be used:...If there is a dual latching device (doors, latches, swivels, retainers) each of which can withstand the applicable load (ultimate)." This approach is based on the idea of fail-safe capability i.e. the "spirit of damage tolerance", which is not currently recognised/addressed in the proposed CM. Airbus proposes that the CM may be changed to to take benefit of this approach.	Airbus proposes to change the note on page 6/7 to read (additions underlined): "Note: All interior structure and item of mass removals should be supported by thorough inspection, as appropriate to the design philosophy, of the attachments. This should include appropriate guidance, e.g., allowable damage limits etc., in supporting maintenance documentation. Particular attention should be paid when using existing fittings and seat track for a new interior. <u>In particular, the 1.33 factor is not required if the design incorporates redundant attachments for which fail safe capability is demonstrated against un-factored CS 25.561(b) loads.</u>"	Yes	Yes	Not Accepted	EASA considers the existing potential for many interpretations regarding the means of compliance could be open to inconsistent interpretation, or abuse. Therefore, EASA considers acceptance of this philosophy to be beyond the scope of this CM at the moment. However, future amendments to the CM could incorporate such an approach if applicants are able to show a consistent conservative approach, e.g. by use of appropriate examples etc.
12	*Airbus SAS*	§1.1	4/7	As an internal guidance, Airbus has developed a "Stress Policy". Current Airbus stress policy includes the provision saying that… "No wear and tear attachment factor (1.33 factor per CS25.561) has to be used:...For Crew Rest Compartment, as long as no occupancy is allowed during emergency landing and there is infrequent removal without any signs of wear and tear"	Airbus proposes to change CM §1 , 2nd sentence to read (additions underlined):. "This Certification Memorandum does not attempt to address other structural items which may attract the use of such a factor, e.g. engine mounts, or latches, or attachments of seats, berths, and safety belts as referenced in CS 25.785, 25.787, 25.789. <u>The 1·33 'Wear and Tear' factor is not relevant for cases where compliance is covered by CS 25.561(c)(1).</u>"	Yes	Yes	Not Accepted	EASA agrees with the regulatory point made within the comment. However, EASA considers that the first sentence in Para. 1.1 'Purpose and Scope 'clearly identifies applicability to CS25.561(c)(2), which also identifies applicability relative to CS25.561(c)(1), i.e. 'When such positioning is not practical…'.
13	*Airbus SAS*	2	5/7	Airbus understands the wear & tear factor is originally planned for quick change interior items like tie-downs, chains and tensioner. The intended function for an equipment / System acc. to Subpart F includes these substantives (wear & tear), when essential within of his requirements established in the dedicated specification.	Airbus proposes to differentiate within of the Certification Memorandum (CM) between structural items and Equipment / Systems to avoid misunderstandings to double this factor within of equipments or systems.	Yes	Yes	Partially Accepted	EASA agrees that the CM does not intend multiple applications of the 1.33 factor to the same attachment. However, EASA also considers that the appropriate design organisation should take responsibility for understanding what an Equipment/Systems supplier has used in its specification and how it may apply to the intent of this CM, e.g. at the Equipment/System interface with the airframe structure. Note added to the text.
14	*Airbus SAS*			For seat certification, Airbus considers the 1,33-fitting factor only for the floor attachments of the seat to the A/C-structure and for the seat belt attachment to the seat.	Airbus proposes to delete the mass specifications with regard to items of mass attached to seats since for low weights the safety factors are high anyways. This is further supported by the fact that §25.561 (c) speaks explicitly of "large masses". To our understanding, masses > 0,15 kg are not necessarily large masses.	Yes	Yes	Not Accepted	EASA agrees that the masses identified in the note are not large. However, the intent was to provide some level of consistent interpretation of mass thresholds common with existing guidance materials and EASA Cabin Safety Section guidance. EASA also notes increasing complexity and number of attachments being applied to seat structures, e.g. entertainment systems etc. such that consideration of removable masses becomes appropriate.

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15	*EASA*	3.1	7	Just a small remark: the use of parenthesis makes a bit unclear the Note: "Note: The 1·33 factor is considered appropriate for all attachments of items of mass > 0,45 kg (1lb) likely to experience frequent removal (> 0,15 kg (1/3lb) if attached to a seat) and all safety equipment mountings (PBE, Fire Extinguishers, Oxygen Bottles, etc.)."				Accepted	Text amended accordingly.