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Title	Reorganisation of CS-23
NPA Number	NPA 2016-05

UK CAA (European.Affairs@caa.co.uk) has placed **17** unique comments on this NPA:

Cmt#	Segment description	Page	Comment	Attachments
39	(General Comments)	0	**Page No:** All **Paragraph No:** General **Comment:** It is recommended that a gap analysis between current FAR/CS23 ASTM and proposed ASTM should be made available, to assist both the applicants and authorities determining certification bases for products, including assessing the changed product rule. **Justification:** There may be some logistical issues to be overcome when contemplating changed product rule with regards to modifications to existing products certificated in accordance with previous amendments of CS-23, following this substantial reorganisation of both CS and FAR 23 codes.	
40	(General Comments)	0	**Page No:** All **Paragraph No:** Whole document – ASTM standards. **Comment:** The accessibility and cost implications for the proposed CS-23 referenced ASTM standards, once the free to view web access during the NPA comment period ends, should be fully evaluated before the proposals proceed. Consideration should be made to ensure that prospective additional access costs to the relevant ASTM are not significant, and downloadable ASTM content is available that can be incorporated into certification bases. **Justification:** It is questionable whether there should be a cost associated with gaining access to required safety-related material. It will form an additional (ASTM) annual subscription cost to each applicant seeking approval of a Part 23 type, (and also to the Regulators involved with the approval process). Current restrictions on ASTM availability may also pose a problem for applicants seeking to compile compliance plans and compliance checklists.	
41	2. Explanatory note — 2.3. Impact analysis	11 - 14	**Page No:** 12 **Paragraph No:** Question for stakeholders - safety benefits **Comment:** It is noteworthy that this NPA's objective is "to maintain the level of safety provided by the current CS-23 and CS-VLA requirements." Consequently, any improvements in safety through use of new technologies and introduction of new safety – enhancing technologies is dependent on the response of industry, and an appropriate level of compliance oversight.	

			It is also notable that in response to existing safety concerns the proposed requirements also include new enhanced standards for resistance to departure from controlled flight and for flight in icing conditions. These new requirements are significantly more prescriptive than the other requirements that have been developed in accordance with the new objective-based philosophy. Thus, it would seem that when there is a need to ensure a level of safety, the use of more traditional, prescriptive requirements are relied upon. It is suggested that this is an indication of the safety benefits to be had from more prescriptive requirements and that a better overall balance needs to be achieved in the final version of a reorganised CS-23. To achieve this more easily and cost effectively, it should be recognised that the wide range of applicability of CS-23 has been regarded as a difficulty in the development of the code. Thus, its continued application to 'single seat' (level 1) types, through to 'commuter' (level 4) types will continue to hamper and compromise the new requirements which could otherwise be tailored to the task if, for example, level 3 and 4 types were placed into a new 'CS-24'.	
42	2. Explanatory note — 2.3. Impact analysis	11 - 14	**Page No:** 13 **Paragraph No:** Question for stakeholders- cost savings **Comment:** The NPA states that the principle benefit to industry will be a cheaper certification process resulting from saving in EASA's rulemaking process. However, this needs to be offset against the increased costs to industry resulting from its participation in the development of industry standards, and the ongoing costs associated with the access to those standards that exist today (outside of this NPA period). The objective should be to facilitate an increase in the level of safety through use of innovative technologies with minimal or no increase in certification process costs.	
43	CS-23 — SUBPART B — FLIGHT — CS-23.2115 Take-off performance	20	**Page No:** 20 **Paragraph No:** CS-23.2115 Take-off performance **Comment:** CS.23.2115 does not refer to runway type or runway surface condition, yet levels 1 and 2 aeroplanes sometimes operate from grass runways.. Reference to the type of runway surface needs to be added; see proposed text. For runway surface conditions, see comment on CS-23.2625. **Proposed Text:** In CS-23.2115, add:- (a) The applicant must determine aeroplane take-off performance accounting for:- **(4) the effect on these distances of operation on other types of surface (e.g. grass, gravel) when dry, may be determined or derived and these surfaces listed in accordance with CS 23.2625(a)(2).**	
44	CS-23 — SUBPART B — FLIGHT — CS-23.2115 Take-off performance	20	**Page No:** 20 **Paragraph No:** CS-23.2115 Take-off performance	

			Comment: CS-23.59(a)(2) and (b)(2) specified a factor of 115% on the all-engines-operating take-off run and take-off distance, but this is not covered in the proposed CS-23.2115. The Class A performance operating rules do not specify any factors of their own in this respect so this needs to be covered at certification by CS-23. **Proposed Text:** Include the factors of CS-23.59.	
45	CS-23 — SUBPART B — FLIGHT — CS-23.2120 Climb performance	21	**Page No:** 21 **Paragraph No:** CS-23.2120 Climb performance. **Comment:** EASA-Ops CAT.POL.A.305 and CAT.POL.A.325 require compliance with WAT limitations and assumes the availability of this information in the AFMs. CS-23 was deficient in requiring this information for aeroplanes below 2730kg. It Is understood that this was because the authors of JAR-23 assumed that the WAT limits applicable to aeroplanes over 2730kg would be applied by the operating rules to aeroplanes below 2730kg. **Justification:** The purpose of WAT limits is to ensure that the aeroplane has acceptable minimum climb or acceleration capability to a reasonable height above the take-off and landing aerodrome. There are many aeroplanes on the EU register which do not have this information available and cannot comply with EASA-Ops. This anomaly needs to be corrected in CS-23.	
46	CS-23 — SUBPART B — FLIGHT — CS-23.2120 Climb performance	21	**Page No:** 21 **Paragraph No:** CS-23.2120 Climb performance. **Comment:** Although the gradients from CS-23 have been retained in this reorganisation, the configurations and speeds to be used in their determination have not, but these are equally important and need to be specified too. **Proposed Text:** The existing criteria from CS-23 Amdt. 4 should be included.	
47	CS-23 — SUBPART B — FLIGHT — CS-23.2125 Landing performance	22	**Page No:** 22 **Paragraph No:** CS-23.2125 Landing performance **Comment:** The landing speeds to be used in the determination of landing distances need to be specified. These need to be defined in terms of margins above the stall speed, as is the case in CS-23 Amdt. 4. **Proposed Text:** The existing text and criteria from CS-23 Amdt.4 should be included.	
48	CS-23 — SUBPART B — FLIGHT — CS-23.2125 Landing performance	22	**Page No:** 22 **Paragraph No:** CS-23.2125 Landing performance **Comment:** CS.23.2125 does not refer to runway type or runway surface condition, yet levels 1 and 2 aeroplanes sometimes operate from grass runways, and level 4 types may encounter	

			contaminated conditions particularly in commercial operations. Reference to the type of runway surface needs to be added; see proposed text. For runway surface conditions, see comment on CS-23.2625, **Proposed Text:** In CS-23.2125, add:- The applicant must determine, for standard temperatures at weights and altitudes within the operational limits: (a) The landing distance, starting from a height of 15 m (50 ft) above the landing surface, required to land and come to a stop. **The effect on these distances of operation on other types of surface (e.g. grass, gravel) when dry, may be determined or derived and these surfaces listed in accordance with CS 23.2625(a)(2).**	
49	CS-23 — SUBPART D — DESIGN AND CONSTRUCTION — CS-23.2320 Flight control systems	33 - 34	**Page No:** 34 **Paragraph No:** CS-23.2320 Flight control systems, paragraphs (a)(1) and (b)(1) **Comment:** CS-23.2320 Flight control Systems paragraphs (a)(1) and (b)(1) are worded such that the flight control system and trim systems must respectively: “Prevent major, hazardous, and catastrophic hazards, including and “Prevent inadvertent, incorrect or abrupt trim operation”. By requiring that the applicant “prevent” these conditions, an absolute is demanded. However, it is believed that the intent was to consider the cited failures in a manner that would be comparable with CS-23.2510 (CS23.1309), to the extent that any such failure could only be tolerable if its probability was inversely proportional to the severity of the effect. Thus, it is proposed that by rewording the requirements to reflect the standard safety assessment approach promoted by “1309” and now by 2510, an appropriate assessment could be undertaken. **Justification:** The only effective means to prevent hazards and incorrect trim operations would be to deactivate the systems or possibly ground the aircraft. This is not thought to be the intent of the requirement and a proposal is provided. **Proposed Text:** Amend to read: (a) The flight control systems must: (1) Prevent major, hazardous, and catastrophic hazards **occurring more frequently than required by CS-23-2510(a)(2)**, including: (i) likely failure conditions; (ii) Operational hazards; (iii) Asymmetry; and (iv) Misrigging (2) Operate easily, smoothly, and positively enough to allow normal operation. (b) Trim systems must:	

			(1) Prevent inadvertent, incorrect, or abrupt trim operation **events more frequently than required by CS-23-2510(a)(2)**; (2) Provide a means to indicate: (i) The direction of trim control movement relative to aeroplane motion; (ii) The trim position with respect to the trim range; (iii) The neutral position for lateral and directional trim; and (iv) The range for take-off for all applicant-requested centre of gravity ranges and configurations. (3) Limit the range of travel to allow safe flight and landing if an adjustable stabiliser is used.	
51	CS-23 — SUBPART F — SYSTEMS AND EQUIPMENT — CS-23.2500 General requirements on systems and equipment function	44	**Page No:** 44-48 **Paragraph No:** Subpart F Systems and Equipment – Omission of EMC. **Comment:** In conjunction with the need to ensure that equipment and systems perform their intended function, it is necessary to ensure that equipment performs correctly in the presence of other aircraft systems, and therefore demonstrate electromagnetic compatibility (EMC). This is usually performed in conjunction with the relevant requirements, such as CS-23 Amendment 4 paragraph 1351(b) or 1431(b). The scope of these is no longer included in these proposals and therefore the need for aircraft systems to demonstrate electromagnetic compatibility is not addressed. Consequently, the risk of interference to required aircraft systems due to incompatibility of particular functions is not addressed. **Justification:** If EMC isn't required, the risk of interference and abnormal operation due to internal electromagnetic disturbance cannot be guaranteed. **Proposed Text:** Include the relevant requirement from CS-23 Amendment 4, such as paragraph 23.1431(b): **Radio and electronic equipment, controls, and wiring must be installed so that operation of any unit or system of units will not adversely affect the simultaneous operation of any other radio or electronic unit, or system of units.**	
50	CS-23 — SUBPART F — SYSTEMS AND EQUIPMENT — CS-23.2510 Equipment, systems, and installations	44 - 46	**Page No:** 44-46 **Paragraph No:** CS-23.2510 Equipment, systems, and installations **Comment (1):** The blue explanatory text for CS-23.2510 includes a statement that: "*The terminology used in NPRM 23.1315(a) may be confusing. Indeed, NPRM 23.1315(a) does not use the terms 'catastrophic', 'hazardous' or 'major failure condition'. Instead, it uses the expressions: 'continued safe flight and landing' and 'significantly reduce the capability of the aeroplane or the ability of the flight-crew to cope with adverse operating conditions'. It is EASA's opinion that those expressions are not uniquely defined and it could be difficult*	

			for an applicant to link: *— the terms 'catastrophic' and 'continued safe flight and landing' ; and* *— the expressions 'hazardous' and 'major' and 'significantly reduce the capability of the aeroplane or the ability of the flight-crew to cope with adverse operating conditions' expressions.* *EASA is very much in favour of having those defined at rule level to avoid unnecessary and time-wasting debate*." However, the text that is then presented in the form of CS-23.2510 does not define the failure severity terms Major, Hazardous or Catastrophic, nor refer to where these can be found. They are not defined in CS-23.2000 either. **Comment (2):** If it is accepted that the intent of CS-23.2510 is to be no more stringent than any other CS-xx.1309, then it is important to recall that only catastrophic, hazardous and major conditions are "required" to be demonstrated to be sufficiently unlikely at *rule* level. Minor conditions are not required by the rule to be shown to be "probable", they are allowed to be this by the AMC/AC. However, the illustration (Figure 1) that is now presented within CS-23.2510(a)(2) now requires "by rule" that Minor and No Safety Effect failure conditions <u>are shown to be probable</u>. A definition of probable is provided within CS-23.2510(b)(4) as a condition that is anticipated to occur more times during the entire operational life of each aeroplane. This is ambiguous, but it is usually proportionately considered just more likely than "remote". It should be recalled that within AMC25.1309, "Probable" is not assigned a quantitative objective, but a nominal value of no more than one event per 1000 hours can be used in some analyses. However, this "implies" some form of qualitative assessment, and whilst what CS-23.2510(a)(2) is little different materially, it is now not only <u>requiring</u> minor conditions to demonstrate this (which might be difficult because the depth of analysis stated within "current AMC" does not promote the need for use of the "SSA" for minor failure conditions) yet Figure 1 is implying that this also be demonstrated for those conditions that were classified as No Safety Effect. This is thought to be disproportionate. **Justification:** The requirement text does not fulfil the stated ambition of the explanatory text and results in requirements that are disproportionate. **Proposed Text:** A revision to the section is needed as described above.	
52	CS-23 — SUBPART F — SYSTEMS AND EQUIPMENT — CS-23.2520 High-intensity radiated fields (HIRF) protection	46 - 47	**Page No:** 46-47 **Paragraph No:** CS-23.2520 High-intensity radiated fields (HIRF) protection **Comment:** The HIRF requirements of CS-23.2520 refer to aeroplane functions not being adversely affected when exposed to the HIRF environment. Yet a HIRF environment isn't defined or included within the CS. There are currently two HIRF environments for fixed-wing aircraft that need to be assessed in conjunction with each other to apply to CRITICAL aircraft functions or aircraft systems (see CS23.1308, Amdt 4). The change as presented is seen to focus on only system function and not consider the performance of all systems that perform the function; essential functions (Hazardous	

			and Major failure conditions) are also not seen to be addressed anymore. This therefore departs from the universally harmonised approach for fixed and rotary wing HIRF compliance. **Justification:** The requirement does not consider the lower-level of HIRF compliance for "each" system performing critical functions and has omitted the need to consider essential function systems that need to be HIRF compliant to a degree proportional to the hazard severity. The HIRF environment does not discriminate between types of aircraft. The requirements have been harmonised for several decades and are applied in a proportionate manner dependent on the severity of any associated hazard. If aircraft can be considered to not suffer any catastrophic or hazardous or major failures then compliance would not of course be necessary, but if failures of such severity are possible then protection against the expected environment should be provided. By not including full compliance with the completely defined HIRF environment(s) would render any approach to compliance with CS-23.2500(a)(2) as incomplete. HIRF is part of the environment. **Proposed Text:** New texts, from CS-23.1308 Amdt 4, should be developed to: re-align requirements for Critical and Essential systems with defined HIRF environments; provide definition of HIRF environments; and define proportionate response for HIRF compliance for essential systems.	
53	CS-23 — SUBPART G — FLIGHT CREW INTERFACE AND OTHER INFORMATION — CS-23.2625 Aeroplane flight manual	51	**Page No:** 51 **Paragraph No:** CS-23.2625 Aeroplane flight manual **Comment:** Because of the wide range of types covered by CS-23 it needs to be recognised that the operating rules which will be applicable to them will also vary widely. Consequently, it would be more efficient and therefore beneficial if CS-23.2625 included an all-encompassing requirement to include the performance information required by the applicable operating rules. The AFM must contain information required by CS-23.1583, CS-23.1589, other information necessary for safe operation and information necessary to comply with the operating rules **Proposed Text:** Amend to read: (a) The applicant must provide an Aeroplane Flight Manual that must be delivered with each aeroplane that contains the following information: (1) Operating limitations and procedures; (2) Performance information; (3) Loading information; (4) Instrument marking and placard information; and (5) Any other information necessary for the safe operation of the aeroplane, **and performance information necessary to comply with the applicable operating rules**.	
54	6. AMC to CS-23 — AMC 23.1	53	**Page No:** 53	

	Purpose and scope		**Paragraph No:** 6 AMC to CS-23 **Comment**: It appears from the proposals that applicants will be able to use a mixture of the AMC for the aircraft type in question, e.g. CS-23 and associated AMC No. 1 plus No. 3 ASTM, or CS-VLA and associated AMC No. 2 plus No. 3 ASTM. **Justification:** This is undesirable because choosing specific individual requirement paragraphs across the available AMC options means a potential “mix and match” lower compliance standard could be achieved.	
55	6. AMC to CS-23 — AMC 23.1 Purpose and scope	53	**Page No:** 53 **Paragraph No:** 6 AMC to CS-23 **Comment:** It is unclear whether EASA and FAA will maintain a watch on ASTM activity to ensure that a non-standardised series of compliance approaches does not develop. In any case, this needs to be addressed Nevertheless, raising a CRI for novel/unusual features would still seem a faster route than waiting for the development of new ASTM standard material. **Justification:** Clarification required.	