CRD - NPA 10/2004

Comment	Response
I-B	
Paragraph ***CS 25J901***	
Cmt. ***1 / F. Fagegaltier***	
1 - The proposed 25.901 (a)(1) is close but is not identical to the definition of an APU in CS-Definitions. It is assumed that the intent is to refer to the "APU" in this sub-paragraph (a)(1) as it is done in (a)(2) and (3). Consequently, it is suggested changing (a)(1) to read (1) The APU 2 – In the title of subpart J the words "gas turbine" should be deleted because they are part of the definition of an APU : "gas turbine APU" is therefore a redundant wording.	1. Agreed 2. Agreed
Cmt. ***22 / Boeing***	
Revise the text of proposed paragraph 25J901(a) to read as follows: (a) For the purpose of this subpart , the APU includes: (1) Any engine delivering rotating shaft power, compressed air, or both, which is not intended for direct propulsion of an aeroplane. (2) Each component that affects the control of the APU. (3) Each component that affects the safety of the APU and the APU installation.	Not agreed (see also JAA comment-response document). APU is already defined in CS-Definitions. What is added here are the elements that compose the APU installation.

Comment	Response
I-B	
Paragraph ***CS 25J903***	
Cmt. ***18 / DGAC, France***	
Replace the proposed CS 25-J-903(a) by : (a) An essential APU must meet the CS-APU specifications for a category 1 APU	Not agreed. NPA text is clear enough achieving the same intent as proposed by the commentor.
Cmt. ***21 / Boeing***	
Revise the text of proposed paragraph 25J903(d)(2) to read as follows: (2) The APU system must be designed and installed to give reasonable assurance that those APU operating limitations that adversely affect rotor structural integrity will not be exceeded in service.	Not agreed. NPA text is closest to the original text and the text proposed by the commentor may introduce undesired new interpretations.

Comment	Response
I-B	
Paragraph *CS 25J939*	
Cmt. *3 / F. Fagegaltier*	
CS 25J939 (a) reads as follows (a) APU operating characteristics must be investigated to determine that no adverse characteristics (such as stall, surge, or flame-out) are present, to a hazardous degree, during normal and emergency operation within the range of operation limitations of the aeroplane and of the APU. CS-APU 80 reads as follows: (a) The overall range for APU operating characteristics must be substantiated. This includes the envelopes within which the APU can be started and operated without detrimental effects (such as stall, surge, or flameout). The JAA response to the comment on this paragraph (in fact the comment was registered under 25J393 (a)) is not correct. CS 25.939 has the wording “in flight” in its text (“must be investigated in flight”) : this makes a lot of difference. As it is currently proposed, CS 25J939 (a) almost reproduces CS-APU 80 without recognizing its existence (but using “ adverse” and “hazardous” instead of “detrimental”) and therefore imposes duplication of the APU certification activity. A counter proposal could be as follows CS 25J939 (a) (a) The installation effects potentially affecting the APU operating characteristics must be investigated in flight, within the range of operation limitations of the aeroplane and of the APU, during normal and emergency operation, to determine that the APU operating conditions determined under CS-APU 80 are not exceeded. If this clarification is not retained by the Agency, then, as a minimum, the words “in flight” should be added to be consistent with CS 25.939.	Partially agreed. New text: “APU operating characteristics must be investigated in all aeroplane operating conditions from APU start until shutdown to determine ……”
Cmt. *19 / DGAC, France*	
1) The reference to CS-APU section 1, appendix 1, paragraph 6.18 does not exist. This reference comes from an old version of JAR-APU (not the latest version) and the referenced paragraph 6.18 (mount loads) is apparently not related to the subject of CS 25J939 (APU operating characteristics). (Note: the proposed text of 25J939 (d) is not the one given in the table of part I.C of this NPA). 2) It should be noted that CS-APU includes new specifications (in place of those of 6.18) as follows : CS-APU 120 Mounts Loads The maximum static and dynamic loads, including those that result from APU seizure or imbalance under a failed blade condition, and the critical vibration amplitudes and frequencies which could be transmitted by the APU from the mounting points to the airframe through the normal operating range of the APU must be established and included in the instructions for installation. Consequently, CS-25 should require a check of the design of the mounts so that they would be capable of the loads identified from APU “certification”. The following could be considered : “The mounting structure of the APU must be capable of sustaining without failure the maximum static and dynamic loads and the critical vibration amplitudes and frequencies which could be transmitted by the APU and which are described in the APU instructions for installation.” If such requirement does not fit in 25J939 – APU operating characteristics – as proposed in this NPA, determination of the most appropriate place or decision to change the title of the paragraph is left to the Agency.	Agreed. Reference replaced by CS-APU 120. In CS 25, the APU mounts specifications are stipulated in 25.361/362.

Comment	Response
I-B	
Paragraph ***CS 25J1011***	
Cmt. ***5 / FAA, USA***	
Add the word 'approved' back into the proposed paragraph between 'the' and 'maximum allowable oil consumption'	Not agreed. There is no “approved” maximum allowable oil consumption of the APU. This is not a condition in CS-APU.

Comment	Response
I-B	
Paragraph *CS 25J1043*	
Cmt. *12 / CAA, UK*	
In paragraph (b) "300 meter" should read "300 metres"	Accepted.

Comment	Response
I-B	
Paragraph *CS 25J1093*	
Cmt. *25 / CAA, UK*	
An error seems to have occurred here in the APU requirement for operation in Falling and Blowing Snow - CS 25J1093(b)(2) and associated AMC. 1. In CS 25J1093(b) (first paragraph) reference should be made to AMC 25J1093(b)(1) and AMC 25J1093(b)(2). These are two distinct requirements covering the existing ' Appendix C' icing conditions and the new 'falling and blowing snow' conditions respectively and it is expected that each part will have associated AMC. 2. An AMC for Falling and Blowing Snow conditions against CS 25J1093(b)(2) is not included. Suitable material can be found in JAA NPA 25 E-341, entitled "ACJ No 2 to JAR 25.1093(b) Propulsion Engine Air Intakes Falling and Blowing Snow. (acceptable Means of Compliance) See JAR 25.1093(b)". However this was in error in that it should have also referred to 25B1093(b)(2) and included some mention of APUs in the title. Additionally NPA 25 E-341was incorrect in that it did not include the new rule - JAR 25B1093(b)(2). (equivalent to CS 25J1093(b)(2)).	Noted. The introduction of this AMC will be addressed by Rulemaking task 25.048

Comment	Response
I-B	
Paragraph *CS 25J1121*	
Cmt. *13 / CAA, UK*	
In considering the issues introduced by (1) and (2) below the following revised text is proposed: (a) Each exhaust system must ensure safe disposal of exhaust gases without fire hazard and without hazardous contamination of air in any personnel compartment. For test purposes any method of detection of contamination must be approved by the Agency.	Not agreed: - Although it is recognised that other contamination may exist, widening the scope of this paragraph would impose additional burden on the applicant. The NPA text is fully harmonised with FAR-25 and a similar paragraph in Subpart E of CS-25. If a Regulatory Impact Assessment would show that a widening of the scope of the paragraph is justified, further rulemaking will be considered for this paragraph and also 25.11.21. - test methods are not approved by the Agency but accepted. NPA wording is appropriate.

Comment	Response
I-B	
Paragraph *CS 25J1163*	
Cmt. *14 / CAA, UK*	
The following revised text is proposed: (b) Electrical equipment that may be liable to arcing or sparking, either during normal operation, or under failure conditions, must be installed to minimise the probability of contact with any flammable fluids or vapours that might be present in a free state.	Not agreed. This condition is consistent with 25.1163 which was not changed as a result of the fuel tank safety proposal.

Comment	Response
I-B	
Paragraph ***CS 25J1183***	
Cmt. ***4 / F. Fagegaltier***	
In the response to comment document (part I.D of the NPA), the JAA disagreement with the proposed improvement in format is noted. It is agreed that to accept this policy or to adopt its own is a decision to be made by the Agency. Nevertheless, it is true that the text of sub-paragraph (a) is really unclear : it contains one sentence which is 6 lines long, starting with an except, continuing (in middle) with a second “except” and, within the second exception, an unless The comment made on the JAA NPA would be supported with, of course, the necessary adjustments to fit in CS-25. This would also improve consistency of CS-25 and CS-APU.	Noted. Same response still applies. 25J1183 is similar to 25.1183, which is included in FAR 25 and probably dates back to CAR 4b.

Comment	Response
I-B	
Paragraph *CS 25J1189*	
Cmt. *26 / CAA, UK*	
The advisory material in NPA 25E-339 'Powerplant Shut-off' (suitably corrected to include appropriate reference to APU requirement as intended) should be added as an AMC to CS 25J1189.	Noted. The introduction of the referenced AMC is covered by EASA NPA 13/2004.

Comment	Response
II-B	
Paragraph *AMC 25.981(a) 2 - Background*	
Cmt. *7 / Airbus, France*	
In the figure at the bottom of page 97, all references to JAA material (INT/POL, JAR, AMJ, ACJ) should be replaced by references to the corresponding EASA material.	Accepted

Comment	Response
II-B	
Paragraph ***AMC 25.981(a) 5 - Safety Assessment***	
Cmt. ***8 / Airbus***	
Extremely Improbable The AMC should more clearly define what is expected from the aircraft manufacturer regarding a demonstration of Extremely Improbable. It is feaslible to demonstrate Extremely Improbable for the fuel tank explosion risk and Airbus has already done so in the submissios made for in-service aircraft. The most appropriate method is to demonstrate a fuel tank explosion as Extremely Improbable at aircraft level is a qualitative approach, supported by quantitative data for random failures where appropriate.	Noted, however, it appreas that the proposed AMC provides as much guidance as possible at this stage.

Comment	Response
GENERAL COMMENT(S)	
Paragraph -	
Cmt. ***2 / F. Fagegaltier***	
The numbering in the subpart J is abnormal in many places. For example, we find the sequence (a), (c) and (d) without (b) in 25J939, or (a)(5) without (1) to (4) in 25J961, the worst case being (likely) 25J1557 where we find only (b)(2). This is very confusing : we wonder if some editorial mistake has been made in relation to the missing sub-paragraphs numbers. A valid comment against 25J939 in JAA NPA has not been understood by JAA because the commenter referenced the 3rd sub-paragraph as (c) without realizing it was in fact numbered (d) : this comment is still valid against this proposal (see another comment on this NPA). There are other errors in numbering : for example, 25J901 (d)(i) and (ii) should be (d)(1) and (2).	Partially agreed. The numbering has been chosen to be consistent with the corresponding paragraphs elsewhere in CS-25. This has caused several "holes" in the numbering. Errors in numbering shall be corrected.
Cmt. ***27 / ACG Austria***	
ACG Fully supports NPA	Noted.
Cmt. ***29 / LFV, Sweden***	
LFV has no objections to the NPA.	Noted.

Comment	Response
II-B	
Paragraph ***AMC 25.981(a) - General***	
Cmt. ***6 / Airbus, France***	
CS 25.981(a), AMC 25.981(a), original JAA NPA proposals justification Ignition Source Presence: Wording Should Be Made Consistent [Page 106. 2 Background] States '…this philosophy has been based on the application of fail safe design requirements to the aeroplane fuel tank system to preclude ignition sources from being present in fuel tanks when component failures, malfunctions, or lightning encounters occur.' Airbus notes that the word 'preclude' has now been introduced which in some dictionaries is defined as 'make impossible'. The term 'preclude' is used in ACJ 25.1309 only when referring to a Single Failure resulting in Catastrophic Failure Conditions. The NPA text refers to the plural failures and malfunctions and is therefore confusing. Airbus also notes that there are other such statements in the NPA, which are confusing and contradictory: - [Page 96 - CS 25.981] states 'No ignition source may be present…' yet also requires that an ignition source from a combination of failures must be Extremely Improbable. - [Page 97 - Section 2 - Background] second paragraph, last sentence states '…requires that no ignition sources be present.' In the same section the third paragraph, first sentence states 'ignition of flammable vapours will not occur.' However, [Page 100- section 5.1 – Introduction] states '…the presence of an ignition source within the fuel system is Extremely Improbable.'	Partially accepted 'Preclude' should be replaced by 'prevent'. It is however considered that demonstrating that ignition sources are extremely improbable is consistent with the statement 'No ignition source may be present'.
Cmt. ***9 / Airbus, France***	
Filament Heating Hot filaments are mentioned as possible ignition sources in the figure at the bottom of page 97. However the NPA does not give any limits of acceptable current in relation to filament heating in the fuel tank. Airbus therefore assumes that, as a limit is not specifically stated, then the levels identified by the current intrinsic safety standards are sufficient to demonstrate compliance to the regulation.	Noted. Since the AMC is not providing any value, applicants will be free to propose their own current limit for filament heating, provided this proposed limit can be supported by satisfactory evidence.
Cmt. ***10 / Airbus, FR***	
Exclusions The NPA does not exclude an assessment of ignition sources from Uncontained Engine Rotor Failure, Engine fire, bombs, fire post crash, ground fire propagation through vents, etc. Airbus therefore assumes that ignition sources that could develop from such sources are sufficiently covered by other regulations and thus this NPA is not applicable to such sources.	Noted. This NPA is not intended to remove or add events from the scope of CS 25: the bomb or ground fire threats are not required to be assessed by CS-25, engine rotorburst is subject of a specific risk analysis. Engine fire may need to be taken into account, depending on the design.
Cmt. ***11 / Airbus, France***	
Adjacent Systems The NPA does not provide details of any assessment required for adjacent systems. Airbus therefore assumes that it is considered that ignition sources from adjacent systems are sufficiently covered by other regulations.	Noted. The commentor correctly assumes that adjacent systems are adequately covered by existing requirements, including 25.981(a).

Comment	Response

II-B

Paragraph ***CS 25.981***

Cmt. ***17 / FAA, USA***

25.981 Fuel tank ignition prevention. * * * * * (c) The fuel tank installation must include either-- (1) Means to minimize the development of flammable vapors in the fuel tanks (in the context of this rule, "minimize" means to incorporate practicable design methods to reduce the likelihood of flammable vapors); or (2) Means to mitigate the effects of an ignition of fuel vapors within fuel tanks such that no damage caused by an ignition will prevent continued safe flight and landing.	Not agreed. While JAA participated in the ARAC FTHWG and FTHIWG, none of those groups have produced definitive rulemaking material, and therefore EASA does not concur with the statement that this NPA is in contradiction with the conclusions of those WG. EASA fully concurs that several parameters beyond temperature have a direct influence on fuel tank flammability. However, the EASA position is based on the in-service experience, since heat transfer to the affected tanks was a direct contributory factor in all three accidents. In the absence of any scientific rational, assessment methodology or in-service experience data it is impossible to predict the ignition threa that should be taken into account. FAA typically mentions a 1 J value, equivalent to an average car sparkplug; the value quoted in the commenter letter (several Joules) is equivalent to a jet engine igniter. It could be expected that such energy levels are not present inside the fuel system. Other parameters (fuel properties, environmental conditions) are beyond the control of the aircraft designers. The Monte Carlo assessment appeared to be a very useful methodology for research purposes, but has some inherent limitations as a certification tool. Hence, the EASA considers that the Monte-Carlo method, as currently proposed by FAA, is not the most adequate tool to establish if a tank belongs to either the low or high flammability categories. EASA is fully supporting the harmonization effort conducted in the last years in the frame of the Boeing 747 Flammability Reduction System (FRS) Special Condition. EASA would apply this material to any FRS system using the FAA sponsored concept.

Cmt. ***24 / Boeing***

Add the following: Flammability Reduction or Minimization (a) It must be demonstrated that the overall fleet flammability exposure of each fuel tank is equal to or less than 3% of operational time; (1) The analysis shall be performed per appendix TBD*. (*Appendix TBD would be equivalent to the performance portions of the appendices to the 747-400 special conditions.)	Not agreed. The 3% is obtained by performing a Monte Carlo analysis, and EASA is having some very strong reservation about this methodology. This is an average figure, which is not accurately presenting the risk on some designs (for instance, it allows mitigating exposure to high temperature on the ground or during climb by a long cruise phase, whereas in-service experience is showing events during early flight phases). It should be noted that EASA does not support requiring the Boeing 747 Special Condition for every project. This harmonised SC was drafted following Boeing application for such a system. Requiring it would mandate this design to the whole industry, which does not appear to be justified.