

NR	Comment IR Author Section, table, Page figure			Comment summary	Suggested resolution	Comment is an observation or is a suggestion*	Comment is substantive or is an objection**	EASA comment disposition	
1	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	Sect. 1.2 Ref.: CS25.795	3	The regulation CS25.795 "Security Considerations" covers more than the subject smoke.	Airbus proposes to detail the referenced regulation as follows: - CS 25.795(b)(1), "Flight deck protection" which requires the aircraft to be designed to limit the entry of smoke, fumes, and noxious gases into the flight deck in the event of detonation of an explosive or incendiary device on the airplane, And - CS 25.795(b)(2), "Cabin smoke protection" which requires the aircraft to be designed with means to prevent passengers from being incapacitated by smoke, fumes, and noxious gases that result from detonation of an explosive or incendiary device during flight. For consistency, we propose to refer to EASA AMC 25.795 (b) which is referring to the FAA AC25.795-4 'cabin smoke protection" that are providing acceptable means of compliance to CS 25.795(b)(1)(2).	Y	Ν	Accepted	The Cl



M is updated accordingly.





2)	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	Sect. 3.2 Smoke propagation test	7	Airbus proposes also to consider discrepancies that exist between - AMC to CS25.795(b)(1) and - FAA AC25.795-3 Flight Deck protection and the guidance provided in - FAA AC25-9A.	FAA AC 25-9A accepts that the equipment bay may not be smoke tight to the flight deck and conse- quently a smoke propagation test is acceptable rather than a smoke penetration test. Smoke propa-gation into the flight deck is also acceptable if it is demonstrated that the flight deck smoke removal procedure, required by CS 25.831(d), is working (AC25-94 (11)(4)(iii)).	Ν	Y	Not accepted	The c exists FAA 2 25.79 As de descr alter
					CS 25.795(b)(1) requires to reduce smoke "entry" from cabin to flight deck but does not mention whether this is considered as penetration or propagation test. The AC25.795-3 refers to AC25-9A which in§ 9-a states: [] (iii): equipment bays and open or closed loop equipment cooling systems may interfere with the cockpit systems. When penetration tests are conduction in the equipment bay or in the equipment cooling sys-tems, a small amount of smoke may penetrate the cockpit. That smoke should dissipate				
					Induity when the AFW shoke and fire procedures are used. [] However, the wording of the FAA AC 25.795-3 §7.b.(2) 'Conducting smoke tests using AC 25-9A as a reference' is more stringent as it says: [] Prior to generating any smoke, the applicant should select the airflow settings designed to protect the flight deck from excessive penetration of smoke, fumes, and noxious gases. Wisps of smoke that enter and immediately exit at the occupied compartment boundaries are acceptable, as long as a light haze or stratified haze does not form. []				
					With respect to this last wording, as soon as smoke enters into the flight deck "wisps of smoke" or "light haze" cannot be avoided - and the Flight Deck smoke procedures used are ensuring a rapid dissipation of the smoke. In addition, the Flight Crew members are protected by smoke masks that are always quickly donned. Airbus would appreciate these discrepancies being addressed and clarified in the Certification				
					Memorandum and consider acceptable a small amount of smoke to enter the flight deck under the condi-tions recommended in FAA AC25-9A, for the showing of compliance to CS25.795(b)(1). Note: Airbus also emphasizes that the statement contained in the FAA AC25-795-3 §7 'Demonstration of compliance'				
					Applicants may show compliance with the requirements of CS 25.795(b)(1) by analysis and/or by testing that demonstrates that a positive pressure differential is attainable between the flight deck and any adjacent compartments in all certificated configurations (taking into account the circumstances discussed in paragraph 6c). In showing				



comment is not accepted. EASA disagrees that any discrepancy s between AMC to CS 25.795 (b)(1) and FAA AC25-9A. In fact, AC 25.795-3 gives the possibility to demonstrate compliance with 95(b) (1) by performing tests in accordance with FAA AC 25-9A. escribed in paragraph 3.1, the intent of the CM-CS-011-001 is to ribe an acceptable protocol for smoke propagation testing as an native to what is described by the above-mentioned ACs.



	Com	ment		Comment summary	Suggested resolution	Comment is an	Comment is substantive or	EASA	
NR	Author	Section, table, figure	Page			is a suggestion*	is an objection**	comment disposition	
					compliance, applicants should consider possible dispatch conditions for the systems used to provide the required airflow. [] Positive pressure differential is not true for Airbus aircraft. Although this Certification Memorandum CM-011-001 might not be the adequate vehicle to tackle that issue, additional guidance would be appreciated on that point, too.				
3	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	Table A	7	The Note below the table does not clearly state a limitation to the asterisked item. It is a generic note. It should be worked out more clearly what the asterisk means, it does become clear for the reader	Delete the note or replace by a clear statement what the asterisk means	Ν	Y	Partially accepted	The nc used fi used ii
4	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	3.2, last section on page 7	7	Chapter 11 of FAA AC 25-9A does not explicitely mention pass-fail criteria. If para (4) of chapter 11 is referenced, this should be explicitely mentioned. However, some information of these pass-fail criteria might require clarification.	Add "para (4)" to read as follows: The pass/fail criteria specified in Chapter 11, para (4) of FAA AC 25-9A	Y	Ν	Accepted	The C
5	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	General	N/A	A paragraph Terminology should be added to provide the reader with an unambiguous definition of the terms smoke propagation and smoke penetration. Also within the document, the separation between the two terms should become more obvious.	Smoke penetration testing: The purpose of smoke penetration testing is to prove the tightness of compartments. Smoke propagation testing: The purpose of smoke propagation testing is to validate that appropriate design precautions / measures / procedures are in place to mitigate adverse effects of smoke and fumes under consideration of the environment and crew actions	N	Y	Noted	The co the dif testing
6	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	3.1, last section on page 7	8	"In addition to the above table" The reader might be confused why "double deck passenger aeroplane and overhead stowage compartments" do not appear in the table but are mentioned separately below without giving a clear guideline that the tests are required.	These 2 items should be added into the table if relevant	Y	Ν	Partially accepted	The as double The re design compa occupa
7	Airbus Stephan Runge Airworthiness Operations Regulations & Assurance Manager Dept.: IIAIX	3.1, last section on page 7	8	The used wording "double-deck passenger aircraft" does not define an area like "TABLE A" does.	Please precise "double-deck passenger aeroplanes" with respect to "Compartments" as listed in TABLE A.	Y	Ν	Accepted	The CM



EASA response
ote refers to compartments which have access provisions to be for firefighting/inspection/monitoring. However, the definition in table A is amended to clarify the meaning.
M is updated by replacing 'chapter 11' by 'chapter 11 e. (4)'.
ontent of chapter 3.2 is considered sufficiently clear to describe fference between smoke penetration and smoke propagation g.
ssessment of migration of smoke between different decks of e-deck aeroplanes is added in Table A.
eference to overhead stowage compartments is deleted, as the n objective of the smoke tests expected for this type of artment is to ensure timely fire detection by the cabin pants. The text of the CM has been updated accordingly.
M is undated accordingly
in is applated accordingly.



	Com	ment		Comment summary	Suggested resolution	Comment is an observation or is a suggestion*	Comment is substantive or is an objection**	EASA comment disposition	
NR	Author	Section, table, figure	Page						
8	Boeing		1	THE PROPOSED TEXT STATES:	JUSTIFICATION:	N	Y	Partially	Subpa
	Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs			Regulatory Requirement(s): CS 25.855(h)(2); CS 25.1309 REQUESTED CHANGE: Regulatory Requirement(s): CS 25.831(b),(c); CS 25.855(h)(2); <del>CS 25.1309</del>	AC 25-9A Appendix I states that "section 25.831 has been applied, in the general sense, in consideration of normal operating conditions and failures that could expose the passengers to harmful or hazardous concentrations of gases or vapors." For this reason, 25.831(b),(c) are considered the applicable regulations for smoke penetration/propagation tests where a more specific regulation does not apply. When there is a specific applicable regulation (e.g. 25.855(h)(2) for cargo smoke penetration or special condition requirements for remote crew rest smoke penetration), 25.831(b),(c) are usually not listed.			accepted	of sm refere is dele
9	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 2	4	THE PROPOSED TEXT STATES: CS 25.831(b),(c) are omitted in the regulations listed in the "Background" section. REQUESTED CHANGE: Add the following text: CS 25.831 has been applied, in the general sense, in consideration of normal operating conditions and failures that could expose the passengers to harmful or hazardous concentrations of gases or vapors. For smoke penetration/propagation tests with no specific regulation (e.g. 25.855(h)(2) for cargo smoke penetration testing), CS 25.831(b),(c) are the applicable regulations.	JUSTIFICATION: AC 25-9A Appendix I states that "section 25.831 has been applied, in the general sense, in consideration of normal operating conditions and failures that could expose the passengers to harmful or hazardous concentrations of gases or vapors."	Ν	Y	Not accepted	The sı relate
10	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Table A	6	THE PROPOSED TEXT STATES: Table numbering is 1 through 10, #7 is duplicated REQUESTED CHANGE: Adjust numbering to remove duplicates	JUSTIFICATION: clarification	Y	Ν	Accepted	The C
11	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 3.2	8	THE PROPOSED TEXT STATES: " it is acceptable for smoke to enter the occupied areas (e.g., during the time the access door is opened) if it is demonstrated that smoke does not accumulate or create a hazardous condition when the smoke and fire procedures are used. Any accumulation of smoke in an occupied area would not be acceptable." REQUESTED CHANGE: " it is acceptable for smoke to enter the occupied areas (e.g., during the time the access door is opened) if it is demonstrated that smoke does not accumulate or create a hazardous condition when the smoke and fire procedures are used. Any hazardous accumulation of smoke in an occupied area would not be acceptable."	JUSTIFICATION: The proposed language prohibits "any accumulation" of smoke in an occupied area. This does not seem intentional by EASA, since the purpose of the CM is to acknowledge that smoke can enter the occupied area, as long as it clears. The requested change still prohibits hazardous accumulation of smoke.	N	Y	Not accepted	EASA accum EASA period transi dissip of the smoke create



aragraphs (b) and (c) of CS 25.831 are not related to the subject oke propagation. The table in chapter 1.2 is updated to only ence subparagraph (d) of CS 25.831. The reference to CS25.1309 eted from the Regulatory Requirement(s) on page 1.

ubparagraphs (b) and (c) of CS 25.831 are not considered to be d to the subject of smoke propagation.

CM is updated accordingly.

disagrees to this comment and is still of the opinion that the nulation of smoke in occupied areas is not acceptable. However, recognises that during a smoke propagation test, transient ds may exist where smoke can enter occupied areas. In these ent periods smoke may accumulate but should eventually ate or the conditions should stabilize. During the entire duration smoke propagation test, it should be determined that the e distribution in the compartment under evaluation does not any hazardous condition for the occupants.

eferred text in the CM is not updated.



	Com	nent		Comment summary	Suggested resolution	Comment is an	Comment is	EASA	
NR	Author	Section, table, figure	Page			is a suggestion*	is an objection**	comment disposition	
12	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 3.2 Para. 3.1	8	THE PROPOSED TEXT STATES: "Any smoke entering an occupied compartment when the access door is opened must dissipate within five minutes after the access door is closed." REQUESTED CHANGE: "Any smoke entering an occupied compartment when the access door is opened must substantially dissipate and be obviously clearing within five minutes after the access door is closed." THE PROPOSED TEXT STATES: "The table below summarises the cases in which EASA may accept a smoke propagation test being conducted to evaluate the entry of hazardous quantities of smoke into occupied areas, in addition to, or as an alternative to, conducting smoke penetration tests as per FAA AC 25-9A (ref. Table 1- Smoke tests in paragraph 9)." REQUESTED CHANGE: Clarify (perhaps as a footnote) that the right column meaning is: YES = smoke propagation testing may be performed as a substitute for smoke penetration testing NO = smoke propagation testing is not appropriate YES* = when smoke penetration testing is performed, there may also be a concurrent smoke propagation	JUSTIFICATION: During tests where smoke has entered cabin areas through an access door, it is possible for residual smoke to still be present five minutes after the access door is closed. Smoke that has substantially cleared at the five minute mark and is obviously clearing has been accepted in past certification projects and should continue to be acceptable. JUSTIFICATION: clarification	N	Y	Not accepted Accepted	EASA be sul
14	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 3.1	6	THE PROPOSED TEXT STATES: "The table below summarises the cases in which EASA may accept a smoke propagation test being conducted to evaluate the entry of hazardous quantities of smoke into occupied areas, in addition to, or as an alternative to, conducting smoke penetration tests as per FAA AC 25-9A (ref. Table 1- Smoke tests in paragraph 9)." REQUESTED CHANGE: We think Class E Cargo Compartment (#6) should be "YES*" instead of "NO"	JUSTIFICATION: For Accessible Class E cargo compartment tests, the access door is opened to simulate egress. This comment is predicated on EASA acceptance of comment 13.	N	Y	Not accepted	A smo specif that a the oo of the The re



EASA response
ecognizes that the results of the smoke propagation tests may ject to interpretation on a case-by-case basis.
grees that the use of YES, NO and YES* in Table A of the CM reate confusion. The CM is updated accordingly.
ke penetration is applicable to Class E cargo compartments as ed in FAA AC 25-9A. However, for Class E cargo compartments e accessible during flight, the assessment of smoke entering cupied areas can be done after the assessment of the outcome smoke penetration test is completed.



	Com	nent		Comment summary	Suggested resolution	Comment is an	Comment is	EASA	
NR	Author	Section, table, figure	Page			is a suggestion*	is an objection**	comment disposition	
15	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 3.1	6	THE PROPOSED TEXT STATES: "The table below summarises the cases in which EASA may accept a smoke propagation test being conducted to evaluate the entry of hazardous quantities of smoke into occupied areas, in addition to, or as an alternative to, conducting smoke penetration tests as per FAA AC 25-9A (ref. Table 1- Smoke tests in paragraph 9)." REQUESTED CHANGE: We think the Crew Rest Compartment (without built- in fire extinguishing system) (#9) is currently "Yes*" and should be "YES"	JUSTIFICITION: The lesser amount of smoke that is used in a smoke propagation test is more representative than the amount used in a smoke penetration test for these compartments. This comment is predicated on EASA acceptance of comment 13.	N	Y	Not accepted	In the exting perfor access firefigl See re
16	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Table A	6-7	THE PROPOSED TEXT STATES: REQUESTED CHANGE: Add an item for: "High Wall Suites (premium passenger suites fully enclosed by walls/sidewalls that extend from floor to ceiling)" with a "Yes" in the "Smoke Propagation Test" column	JUSTIFICATION: One type of project where smoke propagation/dissipation testing has been required by special conditions is for premium passenger suites fully enclosed by walls/sidewalls that extend from , floor to ceiling. This should be included in the table, for completeness.	Y	Ν	Accepted	High v the ph used t
17	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Table A	6-7	THE PROPOSED TEXT STATES: "Galley Areas" REQUESTED CHANGE: Change to "Galley Areas (fully enclosed by hard walls and doors)"	JUSTIFICATION: Galley smoke penetration tests are not required in AC 25-9A and are not usually conducted, unless the galley is fully enclosed by hard walls and doors. In that case, because galleys are not designed to be air tight, the smoke propagation test is appropriate.	Y	Ν	Not accepted	In acco recom tests.
18	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Table A	6-7	THE PROPOSED TEXT STATES: Class A Cargo or Baggage Compartments (#2) are listed as "YES" REQUESTED CHANGE: Remove Class A Cargo or Baggage Compartments (#2) from Table A	JUSTIFICATION: Smoke penetration compliance has not been required for Class A compartments and A/C 25-9A states that smoke penetration is "N/A" for Class A Cargo or Baggage Compartments.	N	Y	Accepted	Item n accord



EASA response	
---------------	--

case of crew-rest compartments without built-in fire uishing systems, EASA is of the position that it is acceptable to rm a smoke propagation test to evaluate the phase in which the s provisions to the compartment are used to perform manual hting.

esponse to comment no. 13

vall mini-suites are added with a YES\* in the table to address hase in which the access provisions to the compartment are to perform manual firefighting. The CM is updated accordingly.

ordance with FAA AC 25-9A, smoke penetration tests are nmended for all galley types. The CM allows smoke propagation

no. 2 will be removed from Table A. The CM is updated dingly.



	Com	nent		Comment summary	Suggested resolution	Comment is an observation of is a suggestion*	n Comment is substantive or is an objection**	EASA comment disposition	
NR	Author	Section, table, figure	Page						
19	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Table A	7	THE PROPOSED TEXT STATES: * The main scope of the smoke propagation test is to evaluate the accumulation of hazardous quantities of smoke, flames and extinguishing agents in compartments occupied by the crew or passengers when the access provisions of the compartment in which the fire is located are used. REQUESTED CHANGE: * The main scope of the smoke propagation test is to evaluate the accumulation of hazardous quantities of smoke, flames and extinguishing agents harmful or hazardous concentrations of gases or vapor in compartments occupied by the crew or passengers	JUSTIFICATION: The proposed wording aligns with CS 25.831(b) and AC 25-9A.	N	Y	Partially accepted	EASA 25.855 wordir requir
				when the access provisions of the compartment in which the fire is located are used.					
20	Boeing Carlos A. Guzman, P.E. Systems Engineer BCA – Aviation Safety and Regulatory Affairs	Para. 3.1	7	The amount of smoke and the emission time should be established considering the applicable emergency procedures. In compartments in which the fire- fighting procedure cannot be implemented, smoke should be generated continuously for an amount of time that is sufficient to reach a steady state, i.e. sufficient to produce evidence that no accumulation of smoke would occur in the occupied areas. REQUESTED CHANGE: The amount of smoke and the emission time should be established considering the applicable emergency procedures. In compartments in which the fire- fighting procedure cannot be implemented, smoke should be generated continuously for an amount of time that is sufficient to reach a steady state, i.e. sufficient to produce evidence that no accumulation of hazardous quantities of smoke would occur in the occupied areas.	The added text aligns with the intent of the Certification Memo as discussed in the last paragraph of the Section 2 "Background".	N	Y	Accepted	The ch
21	Bombardier Jean Brousseau, Eng. Pneumatics Fellow,ES DAD / CORE DAD Occupant Safety & Environmental Systems	Table A No.7	6	Table A No.7 requests that Lavatories compartment would be subject to smoke propagation test. This goes beyond current certification rules which requires only for smoke detection test demonstration.	Requested change: Remove Lavatories from Table A and reference to smoke propagation and/or smoke penetration related to Lavatories compartment.	N	Y	Not accepted	In acco is reco reasor



partially agrees on this comment. The original wording of CS 5 and CS 25.857 will be kept but it is recognised that the ng change should cover the 'or' as written in the referenced rements. The CM is updated accordingly.

hapter 3.2 of the CM is updated accordingly.

ordance with FAA AC 25-9A, conducting a smoke penetration test ommended for lavatories. The CM allows to perform a more nable smoke propagation test.



	Comr	nent		Comment summary	Suggested resolution	Comment is an	Comment is	EASA	
NR	Author	Section, table, figure	Page			is a suggestion*	is an objection**	comment disposition	
22	Bombardier Jean Brousseau, Eng. Pneumatics Fellow,ES DAD / CORE DAD Occupant Safety & Environmental Systems	Table A No.9	6	Table A No.9 requests that Crew rest compartment (without built-in fire extinguishing system) would be subject to smoke propagation test. This should not apply to Crew rest compartment that are on the same deck as the one occupied by passengers.	Requested change: Specify that Table A No.9 applies only to Crew rest compartments that are not on the same deck as the one occupied by passengers (eg. Lower deck crew rest compartment)	Ν	Y	Not accepted	Tradit suppre main o stairs o deck o suppre manua perfor suppre all oth
23	Bombardier Jean Brousseau, Eng. Pneumatics Fellow,ES DAD / CORE DAD Occupant Safety & Environmental Systems	Section 3.2, 5 <sup>th</sup> paragraph.	7	It may be difficult to quantify the amount of smoke.	Requested change: Specify that the amount of smoke is to be quantified by the definition of the smoke generator type/model and specific setting of the smoke generator (eg Nitrogen pressure setting, orifice needle valve setting, etc), as already mentioned in the previous paragraph.	Y	Ν	Noted	EASA charac certific coope Certifi becon tests v



ionally EASA has requested the installation of a built-in fire ession system in crew rest compartments located below the deck, in which the access provisions involve the need to use or ladders. For crew rest compartments located in the main or in overhead areas, the installation of a built-in fire ession system is alternative to the demonstration of effecting al fire-fighting capability. Smoke penetration tests should be rmed on compartments that are equipped with built-in fire ession system, regardless of the location of the compartment. In ner cases it is appropriate to perform a smoke propagation test.

acknowledges the need for standardization of the quantity and cteristics of the smoke emitted by smoke generators used in cation tests. EASA is actively pursuing this objective in eration with other Aviation Authorities and intends to update the ication Memorandum when harmonized guidance on the matter nes available. In the meantime, smoke generation in certification will be accepted on a case-by-case basis.