



# Notice of Proposed Amendment 2018-05

## Regular update of CS-25

RMT.0673

### EXECUTIVE SUMMARY

The specific objective of this Notice of Proposed Amendment (NPA) is to propose amendments to CS-25 following the selection of non-complex, non-controversial and mature subjects.

In particular, this NPA proposes amendments to the following items:

Item 1: full and unrestricted movement of cockpit controls. It is proposed to create a new AMC 25.777(c) to clarify the intent of CS 25.777(c).

Item 2: flap and slat interconnection. It is proposed to amend AMC 25.701(d) to correct the reference to FAA AC 25-14.

Item 3: ventilation. It is proposed to fully harmonise CS 25.831(a) with FAA FAR 25.831(a), and to amend AMC 25.831(a) to add acceptable means of compliance for operations without air conditioning.

Item 4: quantity of available oxygen. It is proposed to amend CS 25.1441(c) by introducing an exception applicable to oxygen chemical generators or small sealed, one-time use, gaseous oxygen bottles. A new AMC 25.1441(c) is also proposed regarding the design and maintenance of these sources of oxygen supply to ensure that oxygen is actually available.

Item 5: ashtrays in the lavatories. It is proposed to amend CS 25.853(g) and harmonise it with FAA FAR 25.853(g), i.e. by deleting the requirement to install ashtrays inside lavatories.

The proposed amendments are expected to contribute to updating CS-25 (Book 1 and Book 2) to reflect the state of the art of large aeroplane certification and improve the harmonisation of CS-25 with the Federal Aviation Administration (FAA) regulations. Overall, this would provide a moderate safety benefit, would have no social or environmental impacts, and would provide some economic benefits by streamlining the certification process.

<b>Action area:</b>	Regular updates/review of rules		
<b>Affected rules:</b>	CS-25		
<b>Affected stakeholders:</b>	Design approval holders — large aeroplanes		
<b>Driver:</b>	Efficiency/proportionality	<b>Rulemaking group:</b>	No
<b>Impact assessment:</b>	None	<b>Rulemaking Procedure:</b>	Standard

### EASA rulemaking process milestones



'Regular update of CS-25'

18.6.2018

2019/Q1



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## 1. About this NPA

### 1.1. How this NPA was developed

The European Aviation Safety Agency (EASA) developed this NPA in line with Regulation (EC) No 216/2008<sup>1</sup> (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure<sup>2</sup>. This rulemaking activity is included in the EASA Rulemaking Programme as part of the European Plan for Aviation Safety (EPAS) 2018-2022<sup>3</sup> under rulemaking task (RMT) 0673. The text of this NPA has been developed by EASA. It is hereby submitted to all interested parties<sup>4</sup> for consultation.

### 1.2. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/><sup>5</sup>.

The deadline for submission of comments is **18 September 2018**.

### 1.3. The next steps

Following the closing of the public commenting period, EASA will review all the comments.

Based on the comments received, EASA will develop a decision that amends the certification specifications (CSs) and the acceptable means of compliance (AMC) for large aeroplanes (CS-25).

The comments received and the EASA responses to them will be reflected in a comment-response document (CRD). The CRD will be annexed to the decision.

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<sup>1</sup> Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1) (<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1467719701894&uri=CELEX:32008R0216>).

<sup>2</sup> EASA is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (<http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure>).

<sup>3</sup> <https://www.easa.europa.eu/document-library/general-publications/european-plan-aviation-safety-2018-2022>

<sup>4</sup> In accordance with Article 52 of Regulation (EC) No 216/2008 and Articles 6(3) and 7) of the Rulemaking Procedure.

<sup>5</sup> In case of technical problems, please contact the CRT webmaster ([crt@easa.europa.eu](mailto:crt@easa.europa.eu)).



## 2. In summary — why and what

### 2.1. Why we need to change the rules — issue/rationale

The aviation industry is complex and rapidly evolving. CSs and AMC need to be updated regularly to ensure that they are fit for purpose, cost-effective, and can be implemented in practice.

Regular updates are issued when relevant data is available following an update of industry standards, feedback from certification activities or minor issues raised by the stakeholders.

#### **Item 1: Full and unrestricted movement of cockpit controls**

While some of the large aeroplane manufacturers and airworthiness authorities (including EASA) already interpret CS 25.777(c), or the equivalent FAA FAR 25.777(c), as requiring that flight crew of different stature be able to adequately and simultaneously command full differential brakes and full rudder in the same direction, this interpretation is not universal. Conversely, a certification demonstration of such cockpit controls capability is not necessarily performed by all large aeroplane manufacturers.

EASA has therefore identified the need to clarify the intent of CS 25.777(c). This need has also been identified by discussions held in the Flight Test Harmonisation Working Group (FTHWG)<sup>6</sup> under topic 30.

#### **Item 2: Flap and slat interconnection**

AMC 25.701(d) entitled 'Flap and slat interconnection' refers to FAA Advisory Circular (AC) 25-14 'High Lift and Drag Devices' as an acceptable means of compliance with CS 25.701(d).

FAA AC 25-14 was cancelled by the FAA on 14 March 2000 and its full content has been incorporated into FAA AC 25-22 'Certification of Transport Airplane Mechanical Systems'.

#### **Item 3: Ventilation**

CS 25.831(a) is not harmonised with the equivalent FAA FAR 25.831(a), it provides fresh air requirements for crew members only, and it does not address operations with the air conditioning system off, so it triggers the need for applicants to propose Equivalent Safety Findings (ESFs).

#### **Item 4: Quantity of available oxygen**

CS 25.1441(c) requires a means to allow the crew to readily determine, during flight, the quantity of oxygen available in each source of supply. If an applicant installs an oxygen chemical generator or a small sealed, one-time use, gaseous oxygen bottle, it is not possible to directly comply with CS 25.1441(c) for these sources. Consequently, applicants systematically apply for an Equivalent Safety Finding (ESF).

#### **Item 5: Ashtrays in the lavatories**

Regardless of whether smoking is allowed, CS 25.853(g) requires ashtrays to be located conspicuously both inside and outside each lavatory. FAA FAR 25.853(g) does not require an ashtray to be installed

<sup>6</sup> The FTHWG is one of the working groups formed by the Aviation Rulemaking Advisory Committee (ARAC), itself tasked by the FAA to provide advice and recommendations concerning aviation-related issues.

inside each lavatory. This lack of harmonisation has existed since the first issue of CS-25, when EASA decided to keep the same rule as in JAR-25.

EASA has re-evaluated the pros and cons of requiring ashtrays inside the lavatories and concluded that this rule could be cancelled, considering the following points:

- The time when a smoking ban was being implemented on commercial flights is over, and nowadays, the vast majority of commercial flights are non-smoking flights. Therefore, the associated increase in the risk of people smoking in the lavatories no longer applies.
- EASA is not aware of any issues reported by operators concerning cigarettes found in the ashtrays located in the lavatories, or concerning smoke detection in the lavatories originating from cigarettes.
- Nowadays, when a person deliberately decides to smoke inside a lavatory despite the ban, this person typically tries to avoid leaving any evidence of the act, and therefore does not use the available ashtray in the lavatory.
- The presence of ashtrays in the lavatories may convey an incorrect impression to some people regarding the legality of smoking in the lavatories.

## 2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Section 2.1.

The specific objective of this NPA is to propose amendments to CS-25 based on the above selection of non-complex, non-controversial and mature subjects, with the ultimate goal being to increase safety.

## 2.3. How we want to achieve it — overview of the proposals

### **Item 1: Full and unrestricted movement of cockpit controls**

It is proposed to create a new AMC 25.777(c) to clarify the intent of CS 25.777(c).

### **Item 2: Flap and slat interconnection**

It is proposed to amend AMC 25.701(d) to correct the reference to FAA AC 25-14.

### **Item 3: Ventilation**

It is proposed to fully harmonise CS 25.831(a) with FAA FAR 25.831(a), and to amend AMC 25.831(a) to add acceptable means of compliance for operations without air conditioning (based on the content of previously accepted ESF). This would ease the validation process between EASA and the FAA and would remove the need for applicants to systematically request an ESF for operations with the air conditioning system off.

### **Item 4: Quantity of available oxygen**

It is proposed to amend CS 25.1441(c) by introducing an exception applicable to oxygen chemical generators or small sealed, one-time use, gaseous oxygen bottles. A new AMC 25.1441(c) is also

proposed regarding the design and maintenance of these sources of oxygen supply to ensure that oxygen is actually available, reflecting on the content of the generic ESF.

**Item 5: Ashtrays in the lavatories**

It is proposed to amend CS 25.853(g) and harmonise it with FAA FAR 25.853(g), i.e. by deleting the requirement to install ashtrays inside lavatories.

**2.4. What are the expected benefits and drawbacks of the proposals**

The proposed amendments reflect the state of the art of large aeroplane certification and improve the harmonisation of CS-25 with the FAA regulations. Overall, this would provide a moderate safety benefit, would have no social or environmental impacts, and would provide some economic benefits by streamlining the certification process.



### 3. Proposed amendments and rationale in detail

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in grey;
- an ellipsis '(...)' indicates that the rest of the text is unchanged.

#### 3.1. Draft Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes (draft EASA decision amending CS-25)

##### Item 1: Full and unrestricted movement of cockpit controls

New AMC 25.777(c) is created as follows:

##### **AMC 25.777(c) Full and unrestricted movement of cockpit controls**

###### 1. General.

CS 25.777(c) requires cockpit controls to be located and arranged so that there is full and unrestricted movement of each control by the minimum flight crew. The use of the controls shall be evaluated for pilots across the range of statures required by CS 25.777(c). This evaluation should take into account foreseeable normal and failure conditions.

###### 2. Rudder and brake controls

Particular attention should be paid to rudder and brake controls. The control movement of the rudder pedals and brake pedals should be evaluated in order to ensure that there is full use of all the available controls in the event of an engine failure, including on take-off and including engine failure at low speeds below  $V_{MCG}$ .

The evaluation should ensure that each flight crew is always able to apply full rudder and maximum brake pressure on the same side simultaneously (e.g. full right rudder with maximum right brake pressure and vice versa). Furthermore, the ergonomics of the design should be such that: a) the flight crew can, in each condition, continue to apply brake pressure on the opposite side; and b) inadvertent brake application on the opposite side is precluded.

This evaluation should ideally be performed in a representative simulator, but it may also be performed statically in a representative cockpit.

##### Item 2: Flap and slat interconnection

AMC 25.701(d) is amended as follows:

##### **AMC 25.701(d) Flap and slat interconnection**

FAA Advisory Circular AC 25-14 High Lift and Drag Devices, dated 5-4-88, incorporated in FAA Advisory Circular AC 25-22, Certification of Transport Airplane Mechanical Systems, dated 14 March 2000, is accepted by EASA as providing acceptable means of compliance with CS 25.701(d).



### Item 3: Ventilation

CS 25.831(a) is amended as follows:

#### **CS 25.831 Ventilation**

(a) ~~Each passenger and crew compartment must be ventilated and each crew compartment must have enough fresh air (but not less than 0.28 m<sup>3</sup>/min. (10 cubic ft per minute) per crewmember) to enable crewmembers to perform their duties without undue discomfort or fatigue.~~ Under normal operating conditions and in the event of any probable failure conditions of any system that would adversely affect the ventilating air, the ventilation system must be designed to provide a sufficient amount of uncontaminated air to enable the crew members to perform their duties without undue discomfort or fatigue and to provide reasonable passenger comfort. For normal operating conditions, the ventilation system must be designed to provide each occupant with an airflow containing at least 0.25 Kg (0.55 lb) of fresh air per minute. (See AMC 25.831(a).)

(...)

AMC 25.831 is amended as follows:

#### **AMC 25.831(a) Ventilation**

##### 1. Operations with air conditioning system 'off'

The following provisions should be considered for limited time periods, such as take-off, with the air conditioning system 'off':

- a. There should be a means to annunciate to the flight crew that the air conditioning system is selected to 'off'.
- b. It should be demonstrated that the ventilation system continues to provide an acceptable environment in the passenger cabin and the cockpit for the brief period when the air conditioning system is not operating.
- c. Furthermore, the equipment environment should be evaluated during those periods to ensure that the reliability and performance of the equipment are not impaired. This evaluation should cover the extremes of ambient hot air temperatures in which the aeroplane is expected to operate.
- d. In addition, it should be demonstrated that no unsafe condition will result from limited time operation with the air conditioning system 'off', if a fire occurs. When demonstrating compliance with CS 25.831(d) (cockpit smoke removal), CS 25.857 (occupied areas smoke penetration), and CS 25.858 (smoke detection), the following should be considered:
  - i. During operation of limited time duration with the air conditioning system 'off', the smoke detection systems should be effective.
  - ii. It should be possible for the air conditioning system to be turned 'on' and returned to the approved air conditioning system 'on' configuration to extract any hazardous quantities of smoke.
- e. Finally, the operation with air conditioning system 'off' is intended to be a short duration operation. Therefore, the maximum time period of operation in this configuration should be defined by the applicant and specified in the appropriate operating manuals, along with any related operating procedures necessary to ensure that the above items are addressed.

##### 2. Loss of one source of air conditioning system

The supply of fresh air in the event of the loss of one source, should not be less than 0.18 kg/min (0.4 lb/min) per person for any period exceeding five minutes. However, reductions below this flow



rate may be accepted provided that the compartment environment can be maintained at a level which is not hazardous to the occupant.

#### **Item 4: Quantity of available oxygen**

CS 25.1441(c) is amended as follows:

##### **CS 25.1441 Oxygen equipment and supply**

(See AMC 25.1441)

(...)

(c) Except for oxygen chemical generators and for small sealed, one-time, use gaseous oxygen bottles, there must be a means to allow the crew to readily determine, during flight, the quantity of oxygen available in each source of supply.

(...)

New AMC 25.1441(c) is created as follows:

##### **AMC 25.1441(c) Oxygen chemical generators and small sealed, one-time use gaseous oxygen bottles**

For chemical generators and for small sealed, one-time use, gaseous bottles distributed throughout the cabin for passenger use, the following precautions should be considered in order to ensure that oxygen is actually available:

1. the oxygen supply source should be designed and tested to ensure that it will retain the required quantity of oxygen or chemicals throughout its expected life limit under foreseeable operating conditions;
2. a means should be provided for maintenance to readily determine when oxygen is no longer available in the supply source due to inadvertent activation;
3. the life limit of the oxygen supply source should be established by test and analysis;
4. each oxygen supply source should be labelled such that the expiration date can be easily checked by maintenance;
5. instructions for continued airworthiness should be provided to ensure that the oxygen supply sources:
  - a. are removed from the aeroplane and replaced whenever they have been used, and before they reach their expiration date,
  - b. are not installed on the aeroplane beyond their expiration date; and
6. no single oxygen supply source should supply oxygen to more than six oxygen masks.

#### **Item 5: Ashtrays in the lavatories**

CS 25.853(g) is amended as follows:

##### **CS 25.853 Compartment interiors**

(See AMC 25.853)

(...)



(g) Regardless of whether smoking is allowed in any other part of the aeroplane, lavatories must have self-contained removable ashtrays located conspicuously ~~both inside and outside~~ on or near the entry side of each lavatory door. ~~One ashtray located outside a lavatory door~~ except that one ashtray may serve more than one lavatory door if the ashtray can be seen readily from the cabin side of each lavatory ~~door~~ served.

(...)



#### 4. Impact assessment (IA)

The proposed amendments are expected to contribute to updating CS-25 (Book 1 and Book 2) to reflect the state of the art of large aeroplane certification and improve the harmonisation of CS-25 with the FAA regulations. Overall, this would provide a moderate safety benefit, would have no social or environmental impacts, and would provide some economic benefits by streamlining the certification process. There is no need to develop a regulatory impact assessment (RIA).



## 5. Proposed actions to support implementation

N/A



## 6. References

### 6.1. Related regulations

N/A

### 6.2. Affected decisions

Decision No. 2003/2/RM of the Executive Director of the Agency of 17 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for large aeroplanes («CS-25»)

### 6.3. Other reference documents

- FAA Final rule entitled 'Fuel Tank Vent Fire Protection ' of Federal Register 81 FR 41200, published on 24 June 2016, effective on 23 August 2016 (Docket No.: FAA-2014-0500; Amdt. Nos. 25-142, 21-376, and 129-53).  
<https://www.federalregister.gov/documents/2016/06/24/2016-14454/fuel-tank-vent-fire-protection>
- Correction published and effective on 26 July 2016 of Federal Register 81 FR 48693 (Docket No.: FAA-2014-0500; Amdt. Nos. 25-143, 121-375, and 129-52):  
<https://www.federalregister.gov/documents/2016/07/26/2016-17590/fuel-tank-vent-fire-protection-correction>
- FAA AC 25.975-1 entitled 'Fuel Vent Fire Protection', dated 24 June 2016:  
[https://www.faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentID/1029668](https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1029668)
- Notice of Proposed Rulemaking (NPRM), Notice No. 07-13, entitled 'Special Requirements for Private Use Transport Category Airplanes' (72 FR 38731):  
<https://www.federalregister.gov/documents/2007/07/13/E7-13582/special-requirements-for-private-use-transport-category-airplanes>
- Final rule, SFAR No. 109, entitled 'Special Requirements for Private Use Transport Category Airplanes' (74 FR 21533):  
<https://www.federalregister.gov/documents/2009/05/08/E9-10807/special-requirements-for-private-use-transport-category-airplanes>

