European Aviation Safety Agency

Notice of Proposed Amendment 2015-15

Additional airworthiness specifications for operations: Thermal/acoustic insulation material

RMT.0071 (26.004) — 1.10.2015

EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) addresses a safety and harmonisation issue related to flame propagation and flame penetration resistance characteristics of thermal/acoustic insulation material.

The specific objective is to improve the protection of occupants of large aeroplanes operated in Commercial Air Transport (CAT) by improving certain characteristics of the insulation material installed in the fuselage: their capability to resist propagation of flame and to resist penetration of flame through the material (burnthrough).

This NPA proposes to amend Part-26 and CS-26 by introducing specifications on flammability standards for thermal/acoustic insulation material, which are based on CS 25.856 (a) and (b), and are applicable to already type-certified large aeroplanes used for CAT.

The proposed changes are expected to increase safety of large aeroplanes operated in CAT by preventing or reducing the risk of fire propagation or penetration into the aeroplane fuselage.

The proposed changes will also improve harmonisation with the FAA on this subject.

Applicability	
Affected regulations and decisions:	Regulation (EU) 2015/640 (Part-26) ED Decision 2015/013/R (CS-26)
Affected stakeholders:	Operators and TC holders of already type-certified large aeroplanes, modifiers of large aeroplanes, manufacturers of insulation blankets
Driver/origin:	Safety
Reference:	NPA 2008-13 Notice of Proposed Rulemaking (NPRM) 'Improved Flammability Standards for Thermal/Acoustic Insulation Materials Used in Transport Category Airplanes' Decision No 2009/010/R

Process map	
Terms of Reference (Issue 2):	18.9.2014
Concept Paper:	No
Rulemaking group:	No
RIA type:	Light
Technical consultation during NPA drafting:	No
Duration of NPA consultation:	3 months
Review group:	No
Focussed consultation:	No
Publication date of the Opinion:	2016/Q3
Publication date of the Decision:	2017/Q3

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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this Notice of Proposed Amendment (NPA) in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the Agency's 4-year Rulemaking Programme under RMT.0071 (26.004).

The text of this NPA has been developed by the Agency. It is hereby submitted for consultation of all interested parties[3].

The process map on the title page contains the major milestones of this rulemaking activity to date and provides an outlook of the timescale of the next steps.

1.2. The structure of this NPA and related documents

Chapter 1 of this NPA contains the procedural information related to this task. Chapter 2 (Explanatory Note) explains the core technical content. Chapter 3 contains the proposed text for the new requirements. Chapter 4 contains the Regulatory Impact Assessment (RIA) showing which options were considered and what impacts were identified, thereby providing the detailed justification for this NPA.

1.3. 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/**[4].

The deadline for submission of comments is **8 January 2016.**

1.4. The next steps in the procedure

Following the closing of the NPA public consultation period, the Agency will review the comments received.

The outcome of the NPA public consultation will be reflected in the respective Comment-Response Document (CRD).

The Agency will publish the CRD together with the Opinion addressed to the European Commission, which uses it as a technical basis to prepare a legislative proposal. The Opinion will contain proposed

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1 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).

2 The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such a process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board (MB) Decision No 01-2012 of 13 March 2012 concerning the procedure to be applied by the Agency for the issuing of Opinions, Certification Specifications and Guidance Material (Rulemaking Procedure).

3 In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

4 In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).

changes to Regulation (EU) No 2015/640 of 23 April 2015 on additional airworthiness specifications for a given type of operations (Part-26).

The CRD to this NPA will also contain the resulting text of the draft Decision to amend ED Decision 2015/013/R of 8 May 2015 adopting Certification Specifications for additional airworthiness specifications for operations '(CS-26) — Issue 1'.

The Decision containing the amendments to CS-26 will be published by the Agency when the related amendment to the Implementing Rule on Part-26 is adopted by the European Commission.

2. Explanatory Note

2.1. Overview of the issues to be addressed

Service experience and past accidents of large aeroplanes with in-flight or post-crash-related fires suggest that certain flammability characteristics of thermal/acoustic insulation materials installed in the aeroplane fuselage have contributed to the propagation of an in-flight fire through the fuselage or failed to prevent flame penetration from an outside fire into the fuselage.

The investigations led to changes in the EASA certification specifications for new designs (CS-25 Amendment 6), upgrading the flammability standards for thermal/acoustic insulation material.

The Federal Aviation Administration (FAA) amended similarly FAR-25, but also implemented operational rule changes to make the new flame propagation standards also applicable to large aeroplanes of already certified type designs, when newly manufactured after a certain compliance date or when insulation materials are installed as replacements on in-service large aeroplanes. Furthermore, the operational rule changes made the new flame penetration standards applicable to large aeroplanes with a passenger capacity of 20 or greater when newly manufactured after a certain compliance date.

Requirements for already certified type designs is the major difference between the current EASA and FAA regulations on this subject, because to date similar retroactive measures have not been taken in Europe.

For more detailed analysis of the issues addressed by this proposal, please refer to the RIA section 4.1. 'Issues to be addressed'.

2.2. 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 Chapter 2 of this NPA.

The specific objective of this proposal is to reduce the safety risks due to flame penetration and propagation by introducing retroactive specifications on flammability standards for thermal/acoustic insulation materials, which are based on CS 25.856 (a) and (b), and are applicable to already type certified large aeroplanes used for CAT.

2.3. Summary of the Regulatory Impact Assessment (RIA)

For the RIA, three options have been identified and compared:

— Option 0 ('do nothing') is not an acceptable option compared to the safety risk;

— Option 1 (voluntary implementation of the latest thermal/acoustics insulation material flammability characteristics by aeroplane manufacturers and operators) does not mandate implementation and therefore does not guarantee appropriate coverage of the affected fleet;

— Option 2 (requirement on operators of large aeroplanes to ensure that aeroplanes operated are equipped with thermal/acoustic insulation material of the latest flame propagation standard if the aeroplane is manufactured after a certain date, and on all aeroplanes when thermal/acoustic material is replaced, and if the aeroplane is manufactured after a certain date and has a passenger

capacity of 20 or greater, it is equipped with thermal/acoustic insulation material of the latest flame penetration resistance standard) would ensure a full implementation.

Hence, Option 2 is the one preferred by the Agency.

2.4. Overview of the proposed amendments

The proposed change to Regulation (EU) 2015/640 (Part-26) is:

In Subpart B, a new rule (26.156) to require installation of thermal/acoustic insulation material of latest standards on aeroplanes manufactured after a certain date and on in-service large aeroplanes, when the thermal/insulation material needs to be replaced.

The envisaged change to ED Decision 2015/013/R (CS-26) is:

A new paragraph (CS 26.156) in Subpart B to detail the certification specifications for thermal/acoustic insulation material used in newly manufactured large aeroplanes or as replacement on in-service large aeroplanes.

3. Proposed amendments

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

(a) deleted text is marked with ~~strike through~~;

(b) new or amended text is highlighted in grey;

(c) an ellipsis (…) indicates that the remaining text is unchanged in front of or following the reflected amendment.

3.1. Draft Regulation (Draft EASA Opinion)

DRAFT AMENDED COMMISSION REGULATION (EU) 2015/640

on additional airworthiness specifications for a given type of operations (Part-26)

Subpart B — Large aeroplanes

(…)

26.156 Thermal/acoustic insulation materials

Operators of large aeroplanes used in commercial air transport, type certified on or after 1 January 1958, shall ensure that:

(a) for aeroplanes manufactured before [two years after the effective date of the final rule], when thermal/acoustic insulation materials are installed as replacements after [two years after the effective date of the final rule], those materials shall demonstrate flame propagation resistance characteristics compatible with minimising the effects of in-flight fires;

(b) for aeroplanes manufactured after [two years after the effective date of the final rule], thermal/acoustic insulation materials shall demonstrate flame propagation resistance characteristics compatible with minimising the effects of in-flight fires;

(c) for aeroplanes manufactured after [two years after the effective date of the final rule] and with a passenger capacity of 20 or greater, thermal/acoustic insulation materials (including the means of fastening the materials to the fuselage) installed in the lower half of the aeroplane shall demonstrate flame penetration resistance characteristics compatible with minimising the effects of post-crash fires and the maintenance of survivable conditions in the cabin for a time commensurate with that needed to evacuate the aeroplane.

(…)

3.2. Draft Certification Specifications (Draft EASA Decision)

Draft amendment to Additional airworthiness specifications for operations (CS-26), Book 1, Subpart B — Large aeroplanes

…

CS 26.156 Thermal/acoustic insulation materials

Compliance with Part 26.156(a) and (b) is demonstrated by complying with CS 25.856(a), or equivalent.

Compliance with Part 26.156(c) is demonstrated by complying with CS 25.856(b), or equivalent.

4. Regulatory Impact Assessment (RIA)

4.1. Issues to be addressed

a) Definition and history of the issue

Service experience and past accidents of large aeroplanes with in-flight or post-crash-related fires suggest that certain flammability characteristics, in particular flame propagation resistance of thermal/acoustic insulation materials installed in aeroplane fuselage, may have contributed to propagation of an in-flight fire through the fuselage.

A relevant event was the catastrophic accident involving an MD-11 (Swissair Flight 111) aeroplane on 2 September 1998.

After an extensive investigation and testing it appeared that the standards for flame propagation were insufficient since they did not address real situations with an in-flight fire, its potential ignition sources and means of propagation. There was a need to develop and apply new standards which would improve the flame propagation resistance of thermal/acoustic insulation materials (refer to NPA 2008-13[5] and related CRD to NPA 2008-13[6]).

It has also been concluded that the same thermal/acoustic insulation material could be used to contribute, through improved flame penetration resistance characteristics, to a better protection of the whole fuselage against penetration by an external post-crash fire (burnthrough).

Those new standards (see CS 25.856(a) and (b)) were reflected in CS-25 in Amendment 6 issued in July 2009.

The amendment of CS-25 is only applicable to new type-certifications and in some cases to significant changes to type design. This means that the resulting safety improvements will only be effective for the new generation large aeroplanes. To allow a more rapid introduction of the safety improvements, the need for a retroactive requirement must be considered. Such a retroactive measure would also achieve harmonisation with FAA regulations.

b) Regulatory framework for additional airworthiness specifications for operations and safety improvements

In the Joint Aviation Authorities' (JAA) system, specific additional airworthiness specifications were covered under JAR-26 (Additional Airworthiness Requirements for Operations). In particular, Subpart B was dedicated to CAT (aeroplanes). If rendered mandatory by Member States' national laws, they were applicable to operators of large aeroplanes operating in CAT. Further subparts of JAR-26 were reserved for other categories of aircraft and operations, but were not used.

In the framework of rulemaking task 21.039[7], the Agency intended to define a new regulatory framework for the elaboration and adoption of additional airworthiness specifications for a given type of aircraft and type of operation. An initial proposal was made through NPA 2009-01 and the related CRD to NPA 2009-01, which was published on 13 May 2011. As a result of the comments received, the Agency has

5 See: http://easa.europa.eu/system/files/dfu/NPA%202008-13.pdf

6 See: http://easa.europa.eu/system/files/dfu/CRD%202008-13.pdf

7 Task 21.039 contains additional subtasks from 21.039 (a) to 21.039 (k) in support of the Operational Suitability Data concept. Please refer to the Rulemaking Programme for details.

decided that the most adequate method to introduce additional airworthiness requirements on already certified products will be through dedicated Implementing Rules (IRs) supported by CS. This meant that a new Regulation with an Annex called 'Part-26' would be created. The high-level requirement, applicability and entry into force would be covered by Part-26. The technical details on how to comply with this high-level requirement would be included in CS-26.

RMT.0110 (21.039(k)) covers the transfer of existing JAR-26 Amendment 3 requirements into Part-26 and CS-26. The Agency issued NPA 2012-13[8], proposing the new IRs and associated CS. The associated CRD to NPA 2012-13[9] has been published on the EASA website, followed by Opinion No 08/2013, which was published on 25 September 2013.

Finally, the European Commission published on 23 April 2015 Regulation (EU) 2015/640 on additional airworthiness specifications for a given type of operations (Part-26), and the Agency published on 12 May 2015 ED Decision 2015/013/R on additional airworthiness specifications for operations (CS-26).

Furthermore, the Agency is also developing additional airworthiness specifications for operations which are identified in the Agency's Rulemaking Programme 2014-2017. RMT.0071 is one of these tasks and proposes requirements that were not previously contained in JAR-26.

4.1.1. Safety risk assessment

In its Notice of Proposed Rulemaking (NPRM) No FAA-2000-7909 dated 20 September 2000, the FAA estimated that over a 20-year time period one catastrophic accident like e.g. the accident involving a MD-11 (Swissair Flight 111) aeroplane on 2 September 1998 could occur if new flame propagation requirements were not implemented.

Since that time, the certification specifications for new designs have been updated (CS/FAR-25). The FAA also requires that insulation materials of the latest standards are installed on newly manufactured or on modified aircraft. Similar retroactive measures have not, to date, been taken in Europe.

4.1.2. Who is affected?

— Large aeroplane manufacturers and other design organisations

— Manufacturers of thermal/acoustic materials for large aeroplanes

— Large aeroplane operators

— Modifiers of large aeroplanes

4.1.3. How could the issue/problem evolve?

The issue should resolve by itself in the long term, considering that CS-25 and FAR-25 have been updated for new designs and that the existing fleet will be eventually replaced by these new design aeroplanes. Newly manufactured aeroplanes and modified aeroplanes, for US operators, are also equipped with the adequate insulation materials. However, due to the lack of retroactive measures in Europe, the period during which aeroplanes with lower flammability standard thermal/acoustic materials will still be operating is potentially extended each time a new large aeroplane — of a type for which certification

8 http://easa.europa.eu/rulemaking/docs/npa/2012/NPA%202012-13.pdf

9 http://easa.europa.eu/rulemaking/docs/crd/2012/CRD%202012-13.pdf

basis was established prior to CS-25 Amendment 6 — enters into service. Similarly, opportunities to upgrade the thermal/acoustic flammability standard of replacement materials may be lost if European regulation is not harmonised with the FAA.

4.2. 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 Chapter 2 of this NPA.

The specific objective of this proposal is to reduce the safety risks due to flame penetration and propagation by introducing specifications on flammability standards for thermal/acoustic insulation materials, based on CS 25.856(a) and (b), applicable to already type-certified large aeroplanes used for CAT.

4.3. Policy options

The following three options have been identified and evaluated.

Table 1: Selected policy options

Option No	***Short title***	**Description**
0		Baseline option (no change in rules; risks remains as outlined in the issue analysis).
1		Voluntary implementation: commitment from industry to use improved material beyond that required per their type certification basis when material is changed, and for newly delivered large aeroplanes.
2		Require compliance with CS 25.856(a) for large aeroplanes used in CAT that are newly manufactured or modified after a given date, and require compliance with CS 25.856 (b) for large aeroplanes with a passenger capacity of 20 or greater if manufactured after a certain date.

4.4. Analysis of impacts

Option 1 and 2 would have similar impacts but only on an assumption that voluntary implementation would be widespread.

4.4.1. Safety impact

Option 0:

This option would probably not change the current safety level provided by the flammability standards of thermal/acoustic insulation materials installed on many large aeroplanes already certified. This is because, although some manufacturers and operators may install improved materials voluntarily, this cannot be assured for all affected aeroplanes. This is considered unsatisfactory. Fire-related accidents and incidents of large aeroplanes with negative consequences would potentially continue to occur.

Option 1:

This option would only generate significant safety benefits if manufacturers and operators reacted very favourably to the Agency's recommendations for voluntary implementation of the available safety improvements.

Option 2:

This option would bring upgraded flammability standards to the affected newly manufactured and in-service aeroplanes. This would generate safety benefits by mitigating the risks of fire in case of accidents that involve propagation of flame via thermal/acoustic insulation materials and by mitigating the risks of fire in case of accidents with an external fire burning through the fuselage of an aeroplane into its cabin before an emergency evacuation can be completed.

The improved flame propagation resistance would reduce the incidence and severity of cabin fires, particularly of those in inaccessible areas where thermal/acoustic insulation materials are installed. In case of a post-crash fire, the improved flame penetration resistance would provide additional time for evacuation of occupants by delaying the entry of the fire into the cabin.

4.4.2. Environmental impact

No impact on the environment has been identified.

4.4.3. Social impact

No social impact has been identified.

4.4.4. Economic impact

Option 0 would have no economic impact.

Option 1 or 2:

European designers and manufacturers of some large aeroplanes (i.e. Airbus, ATR) are already meeting many of the intended regulatory changes proposed by this NPA due to the existence of equivalent FAA rules, effective since 2 September 2003. Therefore, the economic impact is expected to be moderate.

Questions to stakeholders
1) What is the share of your fleet which is today compliant with the draft requirements set out in Chapter 3?
2) If your fleet is not fully compliant with the draft requirements set out in Chapter 3, what is the estimated unit cost per a retrofitted aircraft?

4.4.5. General Aviation and proportionality issues

Not applicable for General Aviation.

Proportionality issues have been addressed by defining a threshold only for CS-25 fleet above 20 passengers (see Chapter 3.1., the requirement '26.156 Thermal/acoustic insulation materials', item c)

Note: In Notice of Proposed Rulemaking (NPRM) FAA-00-7909-1, dated 20 September 2000, 'The FAA considers that the requirement for burnthrough protection should be made applicable only to airplanes with a passenger capacity of 20 or greater. This effectively excludes the smaller transport category

airplanes as well as airplanes operating in an all-cargo mode. The primary reason for this is that airplanes with small passenger capacities are not expected to realize a significant benefit from enhanced burnthrough protection owing to their very rapid evacuation capability; that is, they have a favorable exit-to-passenger ratio. Since it is expected that enhanced burnthrough protection will impose additional cast, there must be a commensurate benefit to justify such a proposal. The FAA does not consider that such benefits are substantial for airplanes with low passenger capacities. The specific discriminant of 20 passengers was chosen to be consistent with other occupant safety regulations, such as those for interior materials and cabin aisle width. The FAA considers that the evacuation capability of airplanes with 20 or more passengers, regardless of the exit arrangement, could be improved by enhanced burnthrough protection'.

4.4.6. Impact on 'Better Regulation' and harmonisation

The proposed rule would improve harmonisation with the FAA rules.

4.5. Comparison and conclusion

4.5.1. Comparison of options

Because Option 1 is based on voluntarily implementation, while Option 2 requires the operators to ensure that the aeroplane operated is equipped, where feasible, with improved insulation material, Option 2 is considered the best way to ensure effective implementation of the intentions of this NPA. Hence, Option 2 is the one preferred and recommended by the Agency.

5. References

5.1. Affected regulations

Commission Regulation (EU) 2015/640 of 23 April 2015 on additional airworthiness specifications for a given type of operations and amending Regulation (EU) No 965/2012 (Part-26) (OJ L 106, 24.4.2015, p. 18)

5.2. Affected CS, AMC and GM

Decision 2015/013/R of the EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY of 8 May 2015 adopting Certification Specifications for additional airworthiness specifications for operations 'CS-26 — Issue 1'

5.3. Reference documents

— EASA NPA 2008-13 on 'Thermal/Acoustic Insulation Material'

— Notice of Proposed Rulemaking (NPRM) 'Improved Flammability Standards for Thermal/Acoustic Insulation Materials Used in Transport Category Airplanes' published on 20 September 2000 (Federal Register Vol. 65 No. 183, Notice 00-09, Docket No. FAA-2000-7909)

— Decision N° 2009/010/R of the EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY of 26 June 2009 amending Decision No. 2003/02/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 ») (CS-25 — Amendment 6)

6. Appendices

N/A