TERMS OF REFERENCE

Task Nr:	26.003
Issue:	1
Date:	17 September 2010
Regulatory reference:	Articles 5(5)(e)(vi) and 5(6) of the Basic Regulation (EC)[1]
Reference documents:	CS-25[2], Certification Specifications for Large Aeroplanes JAR 26 amendment 3[3], Subpart B "Commercial Air Transport (Aeroplanes)" NPA 2009-01 on "Operational Suitability Certificate and Safety Directives", 16/01/2009[4] FAA Final rule "Revised Standards for Cargo or Baggage Compartments in Transport Category Airplanes" (docket No 28937) providing FAR Part 25 Amendment 25-93[5] and FAR Part 121 Amendment 121-269[6] CS-25 Amendment 3[7] dated September 2007 and the related NPA 04/2006 ("Symbolic Exit Signs And Revised Standards for Cargo Compartments (D To C)")

1. Subject: Additional airworthiness specifications for operations: Fire hazard in Class D cargo compartments

2. Problem/statement of issue and justification; reason for regulatory evolution (regulatory tasks):

a) Regulatory framework of additional airworthiness specifications for operations

In the JAA system, specific additional airworthiness specifications were prescribed under JAR-26 (Additional Airworthiness Requirements for Operations). In particular, Subpart B was dedicated to commercial air transport (Aeroplanes). If rendered mandatory by

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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). Regulation as last amended by Commission Regulation (EC) 1108/2009 of the European Parliament and of the Council of 21 October 2009 (OJ L 309, 24.11.2009, p. 51).

2 Certification Specifications, including Airworthiness Codes and Acceptable Means of Compliance, for Large Aeroplanes (« CS-25 »), as last amended by ED Decision N°2010/005/R dated 05 August 2010 (Amendment 9)

3 Joint Aviation Requirements – Additional airworthiness requirements for operations (JAR-26) amendment 3, dated 1 December 2005.

4 See NPA 2009-01 on Rulemaking Archives on webpage: http://www.easa.europa.eu/ws_prod/r/r_archives.php.

5 US Code of federal regulations, Title 14 Aeronautics and Space, Part 25 (Airworthiness standards: Transport category airplanes), amendment 25-93 effective 19 March 1998 (docket No 28937).

6 US Code of federal regulations, Title 14 Aeronautics and Space, Part 121 (Operating requirements: domestic, flag, and supplemental operations), amendment 121-269 effective 19 March 1998 (docket No 28937).

7 Decision No 2007/010/R of the Executive Director of the Agency of 12 September 2007 amending 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").

Member States' national laws, they were/are applicable to operators of aeroplanes operating under commercial air transportation. Further subparts in JAR-26 were reserved for other categories of aircraft and operations, but were not used.

In the frame of EASA's rulemaking task 21.039[8], the Agency is defining a new regulatory framework, including definition of implementing rules for the elaboration and adoption of additional airworthiness specifications for a given type of aircraft and type of operation. A proposal was made through NPA 2009-01, and its CRD is scheduled to be published by December 2010. The final Opinion is scheduled for April 2011. This rulemaking task will provide the legal tools within the EU framework for imposing additional airworthiness specifications for operations and should be adopted by the European Commission in April 2012.

However, the exact form and details of the legal tool will not affect the technical substance of the measures to be imposed. The Agency has therefore decided to proceed with the preparation and public consultation of these measures in parallel with the finalisation of the legal tool(s) for imposing them.

The rulemaking task 21.039(k) covers the transfer of existing JAR-26 amendment 3 requirements. In addition, the Agency is also developing new additional airworthiness specifications for operation which are identified in the Agency's Rulemaking Programme and Planning. This rulemaking task (26.003) is one of these tasks.

b) Definition and history of the issue: fire hazard in Class D cargo compartments

There have been a number of fires in the cargo or baggage compartments of transport category aeroplanes, some of which have resulted in accidents and loss of life. Although actions have been taken in the past to improve the safety of these compartments by improving the fire-resistance of liners, the continuing occurrence of fires and the seriousness of the consequences of an uncontrolled fire resulted in a review of the entire cargo compartment classification system.

The Class D compartment was defined as a compartment in which a fire would be completely contained without endangering the safety of the aeroplane or the occupants. It is not accessible to crew members. Instead of including smoke or fire detection and extinguishment systems, Class D compartments are designed to control a fire by severely restricting the supply of available oxygen. Because an oxygen-deprived fire might continue to smoulder for the duration of a flight, the capability of the liner to resist flame penetration is especially important.

When first defined, Class D compartments were envisioned to be small compartments. Later, however, larger Class D compartments were installed in transport category aeroplanes, increasing both the amount of potentially combustible material and the available oxygen. Although there is little or no flow of air into a Class D compartment at the time a fire occurs, there is oxygen available from the air already contained in the compartment. In some instances, particularly when the compartment is larger or only partially filled, the oxygen already present in the compartment may be sufficient to support an intense fire long enough for it to penetrate the liner. Once the integrity of the liner is compromised, there is an unlimited flow of air into the compartment, resulting in an uncontrollable fire that can quickly spread throughout the rest of the aeroplane.

An uncontrollable fire of this nature did occur in 1980 when a Saudi Arabian Airlines Lockheed L-1011 was destroyed shortly after landing. The fire, which resulted in a loss of 301 lives, was reported to have started in a compartment which can be classified as Class D.

[8] Note: 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.

The growing concern over this and other reports of cargo or baggage compartment fires led to the amendment of large transport aeroplane certification standards (FAR Part 25 Amendment 25-60 in May 1986, JAR 25 Change 12 in May 1988). In addition to establishing a maximum volume of 1,000 cubic feet for Class D compartments, this amendment also established new standards for liners with greater resistance to flame penetration for use in Class C and D compartments. These improvements addressed only the type certification of new large transport aeroplanes.

Concerning in-service aeroplanes, operators were required to install liners that meet the new standards introduced in the FAR Part 25/JAR-25, through respectively FAA Part 121 Amendment 121-202 and Part 135 Amendment 135-31, dated February 1989, and JAR 26 first issue dated July 1998. However, unlike the upgraded FAR Part 25/JAR 25, these amendments did not establish a maximum volume for Class D compartments. In addition, the new FAR Part 25/JAR-25 standards apply to all Class C or D compartments regardless of size, while Amendments 121-202 and 135-31 and JAR-26 requirements apply only to compartments greater than 200 cubic feet. The safety benefits that could be gained by replacing existing liners in compartments smaller than 200 cubic feet were not considered sufficient to justify the cost of doing so. Meanwhile, the subsequent appearance of consumer aerosol cans with highly flammable propellants has introduced a hazard that did not exist at that time.

A Boeing-737 operated by Gulf Air was destroyed in September 1983 as a result of an in-flight fire in a Class D compartment. The fire, which resulted in 112 casualties, was attributed to an incendiary device. In February 1988, a fire occurred in the Class D compartment of an American Airlines McDonnell Douglas MD-83. Although there was no loss of lives, the fire severely damaged the cabin floor above the compartment. As a result, the FAA initiated a review of service experience and existing regulations, policies and procedures pertaining to the certification of aeroplanes with Class D compartments.

From this review, it was determined that a dozen of fires had occurred in Class D Compartments over the past two decades. The consequences of those fires ranged from no aeroplane damage and no occupant injury to complete destruction of the Saudi Arabian Airlines Lockheed L-1011, as mentioned above.

Since the time the review of Class D compartments was completed there have also been seven additional known instances of fires occurring in those compartments. Most resulted in no injuries and little or no damage to the aeroplane. The exception, insofar as injuries and damage are concerned, was the fire that occurred in May of 1996 in the Class D compartment of a McDonnell Douglas DC-9 operated by Valujet Airlines. Like the American Airlines MD-83 fire referred to above, that fire involved the carriage of undeclared hazardous materials; however, unlike the MD-83 fire, it resulted in the destruction of the aeroplane with a loss of 110 lives. It must be noted that this undeclared carriage occurred in spite of existing prohibitions concerning such carriage.

Tests conducted by the FAA Technical Center show that aerosol cans can burst if they are in a burning suitcase. The tests further show that if the burst occurs in a non-inert atmosphere, such as that of a Class D compartment, there is immediate auto-ignition of the propellant. The accompanying explosion is of such force and intensity that the liner could be rendered ineffective in limiting the supply of oxygen to the fire. If the burst occurs in an inert atmosphere, such as that of a Class C compartment in which the extinguishing agent has been discharged, the propellant does not ignite and poses no further hazard.

In order to remove the risk of uncontrollable fire in Class D compartments, the FAA issued on 19 March 1998 final rules FAR Part 25 Amdt 25-93 and FAR Part 121 Amdt

121-269 based on NPRM 97-10. These amendments provided the following upgrades:

— elimination of Class D cargo or baggage compartment as an option for future type certification of transport category aeroplanes;

— the Class D compartments in certain transport category aeroplanes already in service and used in passenger service must meet the fire or smoke detection and fire suppressions standards for Class C compartments;

— the Class D compartments in certain transport category aeroplanes already in-service and used only for the carriage of cargo must meet the standards for Class C compartments or the corresponding standards for Class E compartments.

c) Recent regulatory actions in Europe

In 2001, the JAA published NPA 25D-320 and NPA 26B-15 which were similar to FAA NPRM 97-10. In 2003, EASA was established and continued the work initiated by the JAA.

In December 2005, EASA published NPA 04/2006 which led to the Amendment 3 of CS-25 in September 2007, incorporating similar changes as the FAA did in FAR Part 25 Amdt 25-93.

However, retroactive action to address in-service aeroplanes has not yet been completed by EASA.

3. Objective:

The objective is to improve the protection of occupants onboard large aeroplanes operated in commercial air transportation (CAT), by removing the risk of uncontrollable fire in Class D compartments.

This improvement would be reached by upgrading, on large aeroplanes used for CAT, the existing Class D cargo compartments to the current CS-25 standards for Class C or Class E cargo compartments.

4. Specific tasks and interface issues (Deliverables):

— Definition of the regulatory options in order to reach the objective defined above.

— Establishment of the Regulatory Impact Assessment (RIA) based on the selected options.

— Consideration of the RIA outcome and of the objective in order to harmonise as much as possible with FAR Part 121 rule (amendment 121-269); determination of a preferred option.

— Drafting of the specifications and, based on the available results of the rulemaking task 21.039, determination of the regulatory tool to mandate the specifications.

5. Working Methods (in addition to the applicable Agency's procedures):

Agency

6. Time scale, milestones:

NPA publication: 2011/Q2

Decision/Opinion to be published in 2012/Q3