

Ban of Halon in fire extinguishers systems

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The environmental issue

- Halogenated hydrocarbons (Halon) used for years as the main fire-extinguishing agent in civil aircraft fire suppression systems

But....

- with high ozone depleting and global warming characteristics.

The Texts and Regulations

→ The Montreal Protocol

- ban the production of halon in developed states;
- general commitment to progressively achieve a “halon-free” aviation

→ ICAO:

- Annex 8 (new designs) – reference to halon removed from EASA CSs
- Annex 6 (newly manufactured aircraft) – handheld and lavatory fire extinguishers

→ Regulation (EC) No 1005/2009

- On substances that deplete the ozone layer (the Ozone regulation)

→ Part-26

- Additional airworthiness specifications

Dates for halon replacement

Purpose	Location of fire extinguishers	ICAO	Regulation (EU) No 1005/2009	Agency	
				CSs Initial Airworthiness	Regulation (EU) No 2015/640 (Part-26)
End date Mandatory Retrofit	Normally unoccupied cargo compartments	No retrofit mandated by ICAO	2040	Not proposed but the dates in Regulation (EU) No 1005/2009 directly apply	
	Hand-held in cabins and crew compartments		2025		
	Engine nacelles and APU		2040		
	Lavatory waste receptacles		2020		
Forward fit New applications for individual Certificate of Airworthiness (CofA)	Normally unoccupied cargo compartments	Not mentioned	Out of scope of Regulation (EU) No 1005/2009		Not proposed
	Hand-held in cabins and crew compartments	2016 (Annex 6) 39th Assembly: shift to 2018		Out of scope of CS-23, CS-25 and CS-29 (and of Part 21)	18 May 2019
	Engine nacelles and APU	Not mentioned			Not proposed
	Lavatory waste receptacles	2011			18 February 2020
Cut off New applications for type Certificates (new design)	Normally unoccupied cargo compartments	2024	2018	Halon no longer referenced in 'Book 1' of CS-23, CS-25 and CS-29, but neither prohibited, until Regulation (EU) No 1005/2009 applies	Not proposed but the dates in Regulation (EU) No 1005/2009 directly apply, unless there is a case by case derogation obtained per Article 13(4) of Regulation (EC) No 1005/2009
	Hand-held in cabins and crew compartments	Not mentioned	2014		
	Engine nacelles and APU	2014	2014		
	Lavatory waste receptacles	2014	2011		

End Date: i.e. date after which the use of halon would no longer be permitted; all halon fire extinguishers and fire protection systems should be replaced, converted or decommissioned by the end date.

Cut off date: No halon in the design of new application for TC possible .

European Commission maintains 2018 as Cut off date for Cargo Comp.

Forward Fit date: reference date for issuance of the first CofA

Cooperation EASA/European Commission

→ EASA/European Commission discussions

- Clarification of EC Regulation No. 1005/2009, i.e definition of new equipment vs EASA CPR (Part-21)
 - The cut-off dates in the Ozone Regulation apply only to new TC as per Part-21 definition (Ref. Commission Regulation (EU) 2017/605) .
- Halon guide published on EASA and European Commission websites
 - to support aviation industry with complying with the requirements of the Ozone Regulation.
 - clarifications on the interpretation of the cut-off dates applicability, as well as information on the derogation process.
- Derogation process: entry point DG-CLIMA/Member State
 - Derogation by a EU member State in support of a EU Applicant.
 - Non-EU Applicants will have to contact directly DG-CLIMA to start the derogation process.
 - EASA will provide support to the EC upon request (technical evaluation of the derogation proposal).

Certification

→ Examples of certified halon replacement agents

→ Lavatories: FE-36 (HFC-236fa), FM-200 (HFC-227ea)

→ Handheld: 2-BTP

→ Engine/nacelle/APU:

→ Phostrex (Eclipse EA500)

→ HFC-125 (Military Green Aircraft)

Certification

→ Halon-free Portable fire extinguishers

- EASA considers the installation of a new type of Halon-free portable fire extinguisher will require the issuance of a MOC CRI and therefore has to be considered as a major change to the aircraft design.
- EASA has developed generic MOC CRIs to address the installation of portable Halon-free fire extinguishers on large aeroplanes and large helicopters.
- The CRIs define an acceptable means of compliance to the requirements of CS 25.851 and CS 29.851 respectively for large aeroplanes and large helicopters and are based on:
 - the minimum performance standard outlined in ETSO-2C515 (but an ETSO Approval is not mandatory)
 - the guidance of FAA AC 20-42D
- The CRIs require demonstration that performance of the extinguisher is guaranteed in all applicable environmental and operation conditions.

Certification

→ Cargo compartment MPS (1/2)

- In October 2018 a Task Group composed by AAs (FAA, EASA, ANAC Brazil, TCCA) and Industry representatives has been formed in the context of the International Aircraft Fire Protection Systems Forum (IAFPSM) to work on the revision of the Cargo Compartment MPS (ref. DOT/FAA/TC-TN12/11 dated May 2012).
- The MPS was developed as a means of establishing equivalency of a halon replacement agent to Halon 1301 for use in built-in fire suppression systems installed in cargo compartments of large aeroplanes.
- The revised MPS will include a more detailed specification of the test chamber and of the required measurement equipment, as well as a more accurate definition of the acceptance criteria for each fire test scenario.

Certification

→ Cargo compartment MPS (2/2)

- The FAA and EASA have agreed that the MPS needs to be complemented by an additional test addressing a cargo fire scenario in which a more “realistic” fire load is simulated, i.e. a surface burning fire scenario with a combined fire load containing materials that result in surface burning fires, flammable liquid fires, fires from lithium batteries.
- The FAA Tech Center experimented this concept in the tests conducted in 2018 (the so-called “challenge fire test”). The setup used in those tests is to be considered only indicative of what the final test definition could be. The detailed test conditions, including the definition of the fire load (number, type and SoC of batteries; quantity of flammable fluids and other flammable cargo items), are being discussed in the meetings of the Cargo Compartment MPS Task Group.

Thank you for your attention

Questions?

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