EASA
European Union Aviation Safety Agency

Halon Replacement

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STC WORKSHOP

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Halon Replacement

- Halon 1301, halon 1211 and halon 2402 (referred as “halons”) are ozone-depleting substances listed as controlled substances in Group III of Annex I to Regulation (EC) No 1005/2009 (subsequently as Ozone Regulation).
- Owned by EC / Directorate General / Climate Action (DG-CLIMA)
- Halon production in European Union Member States has been banned since 1994, in line with the requirements of the Montreal Protocol
- Halons may be placed on the market and used for so-called “critical uses” set out in Annex VI to the Ozone Regulation.

Halon Replacement

- Halons are fire extinguishing agents that have been used in aircraft fire protection systems.
- Aviation is a recognised critical uses – or applications - as established in Annex VI of the Ozone Regulation have been accepted, however, subjected to certain time-limits.
  - The "cut-off date" is the date after which the use of Halon is prohibited for fire extinguishers or fire protection systems in *new equipment and new facilities for the application concerned*.
  - The "end date" is the date after which halons shall not be used for the application concerned and by which the fire extinguishers or fire protection systems containing halons shall be decommissioned.

Halon Replacement

- Extract from Annex VI of the Ozone Regulation for halon use in aircraft with “cut off dates” and “end dates”

Purpose	Type of extinguisher	Type of Halon	Cut-off date (31 December of the stated year)	End date (31 December of the stated year)
For the protection of normally unoccupied cargo compartments	Fixed system	1301 1211 2402	2018	2040
For the protection of cabins and crew compartments	Portable extinguisher	1211 2402	2014	2025
For the protection of engine nacelles and auxiliary power units	Fixed system	1301 1211 2402	2014	2040
For the inerting of fuel tanks	Fixed system	1301 2402	2011	2040
For the protection of lavatory waste receptacles	Fixed system	1301 1211 2402	2011	2020
For the protection of dry bays	Fixed system	1301 1211 2402	2011	2040

Halon Replacement

- Relation between Regulation (EC) 1005/2009 and (EU) 748/2012
  - Commission Regulation (EU) No 748/2012 of 03/08/2012 lays down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organizations (Annex I – Part21).

Halon Replacement

- Relation between Regulation (EC) 1005/2009 and (EU) 748/2012
  - Under Regulation (EC) No 1005/2009, an aircraft is considered an “equipment”. Annex VI to the Regulation states that “new equipment” means equipment for which, by the cut-off date, neither of the following events has occurred:
    - (a) signature of the relevant procurement or development contract;
    - (b) submission of a request for type approval or type certification to the appropriate regulatory authority.

Halon Replacement

- For aircraft, submission of a request for type certification refers to a submission of a request for a new aircraft type certification.
- A new equipment is for the aviation industry a new product (aircraft type design), and the cut-off date is to be compared with the date of submission of the application for the new type certificate, as per subpart B of Part-21.
  - It does not apply to a changed product, for which an application for change to an existing type certificate, or for Supplemental Type Certificate, is submitted, as per subpart D or E of Part-21.

Halon Replacement

- Cut-off dates are not considered as part of the Type-certification basis as defined in paragraph 21.A.17A of Part-21 (and neither part of the Operational suitability data certification basis as defined in the paragraph 21.A.17B of Part-21).
- In particular, the provisions of paragraph 21.A.17A(c), related to the upgrade of the Type-certification basis in case of extension of the original application for type certificate beyond the time limit established under point 21.A.17A(b), do not apply to the prohibition to use Halons from the applicable cut-off dates.

Halon Replacement

- In other words: in the definition of “new equipment” applicable to the aviation industry, the “date of submission of a request for type approval or type certification” is the date of original application and not the date of a request for extension of the original application, if any.
- “original application” means for EASA TC validation, application at the primary certifying authority, not the application at EASA for validation that could come later (in case of no concurrent certification)

Halon Replacement

- Regulation (EU) No 2017/605 of March 2017 amended the Ozone Regulation by clarifying that “For aircraft, submission of a request for type certification refers to a submission of a request for a new aircraft type certification”.

Halon Replacement

- Derogation process: entry point DG-CLIMA/Member State
  - There is a derogation process
  - Derogation request already filed to DG-CLIMA for Engine application 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 (limited to the evaluation of the technical aspects of the derogation proposal) to DG-CLIMA upon request.

Halon Replacement

- Halon guide (DG-CLIMA / EASA) in preparation
- Working arrangement between EASA and DG-CLIMA to define respective roles and responsibilities on exchange of data/information related to Halon replacement activities
- CRI Axx, for new TC, to trace halon presence / non-presence, including derogation existence.

Halon Replacement

- More ?

Halon Replacement

- Yes !
  - Besides EU Ozone Regulation that set dates, there are ICAO dates
    - Not the same definitions and dates threshold as the EU Ozone Regulation
  - EASA Rulemaking activities
  - Halon replacement status

Halon Replacement

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	Out of scope of CS-23, CS-25 and CS-29 (and of Part 21)	Not proposed
	Hand-held in cabins and crew compartments	2016 (Annex 6) 39th Assembly: shift to 2018			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 mandated by '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		

Halon Replacement

- RMT. 0206, CS-ETSO Amendment 11 issued
  - New ETSO-2C515 for halon-free portable fire extinguishers
  - based on SAE AS 6271 (Halocarbon Clean Agent Handheld Fire Extinguisher)
  - NPA published on 27.02.2015
  - NPA comments until 27.05.2015
  - 10 comments specific to ETSO-2C515
  - CRD : Publication 01 Aug 2016
  - Decision: Decision 2016/013/R - 01 Aug 2016 : CS-ETSO Amendment 11

  - COMPLETED

Halon Replacement

- RMT.0560
- Title: Halon: Update of Part 26 to comply with ICAO standards
  - Applicability
    - TOR Iss. 1: lavatory and handheld fire extinguisher for newly produced large aeroplane and rotorcraft. Note: CS-23/-27 not covered yet
  - Schedule:
    - Foward fit date for handheld: 18 May 2019
    - Forward fit date for lavatory built-in extinguishers: 18 Februray 2020
    - CS-26 Issue 2: 27 Feb 2019
- COMPLETED

Halon Replacement

- Commission Implementing Regulation (EU) 2019/133 was released on 28 January 2019 to amend Regulation (EU) 2015/640 introducing new Part 26 requirements
  - *26.170 Fire extinguishers*

    *Operators of **large aeroplanes** shall ensure that the following extinguishers do not use halon as an extinguishing agent:*

    […]

    *(b) portable fire extinguishers in large aeroplanes for which the first individual certificate of airworthiness is issued on or after **18 May 2019***
  - *26.400 Fire extinguishers*

    *Operators of **large helicopters** shall ensure that the following extinguishers do not use halon as an extinguishing agent:*

    […]

    *(b) portable fire extinguishers in large helicopters for which the first individual certificate of airworthiness is issued on or after **18 May 2019***

Halon Replacement

- Highly Dependent on Industry goodwill

- Certified Halon Replacement
  - Examples
    - Lavatories: FE36, FM200
    - Handheld: 2BTP
    - Engine/nacelle/APU:
      - Phostrex
      - HFC125 (Military Green Aircraft)

- Some more candidates on-going

Halon Replacement

- Minimum Performance Standard (MPSe) is a possible start but likely not the end of the Certification journey
- Some agents need a specific CRI for acceptable mean of compliance

Halon Replacement - Summary

- ICAO and EU Ozone Regulation dates are in place
- „Cut-off date“ clarified with EC
  - New TC only
  - Date is application date for new TC
- Interactions between STC changes post Halon Free configuration (New TC, New CofA) to be further clarified
- New Agent may require specific guidance for certification
- Focus on „Cut-off“ / „Forward fit“ dates but „End dates“ shall not be forgotten

Halon Replacement - Summary

- Contacts
  - For EASA Rulemaking activities:

    Youri Auroque (Regulations Officer)
  - For applications related to Powerplant Systems:

    Remi Deletain (Powerplant Expert)
  - For applications related to Cargo Compartments, Lavatories and Portable Fire Extinguishers:

    Thomas Manthey (Cabin Safety Expert)

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