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AERONAUTICAL INFORMATION CIRCULAR

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AIC
Series A
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AIRWORTHINESS
CAUTION
HALON FIRE EXTINGUISHING SYSTEM AND HALON CONTAMINATION

1. PURPOSE

This AIC provides information on the urgent need to develop and implement halon replacements for civil aviation.
This AIC also results from mandatory continuing airworthiness information originated by an aviation authority of another country to identify and correct an unsafe condition on an aviation product.

2. APPLICABILITY

This AIC is applicable to all aircraft manufactures, Aircraft Owners/Operators, approved maintenance organizations (AMOs), chemical suppliers and fire-extinguishing companies.

3. EFFECTIVE DATE

The requirements for this AIC shall become effective from 06 March 2024.

4. BACKGROUND

4.1. HALON REPLACEMENT

4.1.1. The production of halogenated hydrocarbons (halon), which have been the main fire extinguishing agent used in civil aircraft fire suppression systems, was banned in 1994 with the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. This was mainly due to its ozone depleting and global warming characteristics. Halon is still being widely used in civil aircraft fire suppression systems.

4.1.2. As halon supplies are diminishing and the production of halon has been prohibited by international agreement, halon is mainly available for aircraft use by recycling existing supplies. The majority of the recycling centres are not regulated by State Authorities and

reports of contaminated halon have since surfaced in Europe and in the United States. Thus, recycling of halon gas needs to be rigorously controlled to prevent the possibility of contaminated halon being supplied to the aviation industry.

4.1.3. While halon alternatives for lavatories are available, and that progress has been made in the development of halon alternatives in hand-held fire extinguishers, more work is needed in the development of halon alternatives for cargo compartment and engine/auxiliary power unit fire extinguishing systems, and that regular reviews are necessary to evaluate and understand the implication of potential halon alternatives on the industry and the environment.

4.1.4. At present, there is no viable halon replacement for cargo compartment fire extinguishing systems.

4.1.5. The NCAA recognizes that there are stringent aircraft-specific requirements for each application of halon that must be met before a replacement can be implemented and that any strategy must depend on alternatives that does not pose an unacceptable environmental or health risk as compared to the halon that is being replaced.

4.2. HALON CONTAMINATION

4.2.1. The Civil Aviation Authority of the United Kingdom (UK) has informed EASA [European Aviation Safety Agency] that significant quantities of Halon 1211 gas, determined to be outside the required specification, have been supplied to the aviation industry for use in fire extinguishing equipment

4.2.2. This Halon 1211 has subsequently been used to mi certain FEE [Fire Fighting Enterprises] portable cabin and toilet compartment fire extinguishers that are now likely to be installed in or carried on board aircraft.

4.2.3. The contaminated nature of this gas, when used against a fire, may provide reduced fire suppression, endangering the safety of the aircraft and its occupants. In addition, extinguisher activation may lead to release of toxic fumes, possibly causing injury to aircraft occupants.

4.2.4. In light of that event, the European Aviation Safety Agency (EASA) published an Emergency Airworthiness Directive (AD) No. 2009-0251-E stipulating that significant quantities of contaminated Halon 1211 gas (used in handheld fire extinguishers) were determined to be outside the required specifications and have been supplied to the aviation industry.

4.2.5. Additional to the above paragraphs, a number of Authorities have also issued Airworthiness Directives adopting the EASA AD requirements. SACAR-Part 43.08.2 read together with SA-CATS-GMR, mandates the compliance of Airworthiness Directives issued by the Authority of the aircraft type certificate holder.

5. ACCEPTABLE AND RECOGNISED HALON TESTING AND HANDLING STANDARDS

5.1 ASTM D5632-08 Standard Specification for Halon 1301, Bromotrifluoromethane (CF3Br)

5.2 ASTM D5631-08 Standard Practice for handling. Transportation and storage of Halon 1301, Bromotrifluoromethane (CF3Br)
5.3 ISO 7201-1 Fire protection - Fire extinguishing media - Halogenated Hydrocarbons-Part 1: Specifications for halon 1211 and halon 1301
5.4 ISO 7201-2 Fire protection - Fire extinguishing media - Halogenated Hydrocarbons- Part 2: Code for practice for safe handling and transfer procedures of Halon 1211 and Halon 1301.

6. HALON PROPOSED REPLACEMENT SCHEDULE TIME FRAMES

6.1 Aircraft lavatory fire extinguishing systems, 2011 timeframe;
6.2 In hand-held fire extinguishers, 2016 timeframe and
6.3 In engine and auxiliary power unit fire extinguishing, 2014 timeframe;

Note: the above proposed timeframes will be based on systems used in aircraft for which application for type certification will be submitted after a specified date.

7. REQUIRED ACTION

In light of recent events, the Executive Director of Civil Aviation mandates the following;

7.1 Aircraft Owners/Operators should ensure that measures are taken to ensure that they comply with the EASA AD or the Airworthiness Directives issued by the appropriate Authority of the aircraft type certificate holder or equivalent and any further ADs on this subject to ascertain the quality of recycled halon.
7.2 Aircraft Owners/Operators, AMOs, aviation suppliers and manufacturers should ensure that their quality systems provide a means for requesting from halon suppliers certification documentation attesting to the quality of halon to an established and recognized international standard.
7.3 Furthermore, Aircraft Owners/operators, AMOs, aviation suppliers and manufacturers should verify the quality of halon in their possession or provided by their suppliers, through effective testing or certification attesting to the quality of halon to an established and recognized international standard.
7.4 Organizations involved in recycling of Halon 1211 or 1301 to demonstrate the quality of the recycled halon in their possession and their control of the halon purity in the recycling process.

8. CONCLUSION

Given that the availability of pure halon supplies is dwindling, civil aviation will increasingly rely upon the use of recycled halon. The purity of recycled halon reserves is critical to maintaining the fire extinguishing systems installed on board aircraft today. Halon replacement will require full cooperation of all stakeholders and coordination to achieve uniform and orderly implementation of optimal alternative solutions for halon replacement, which provide adequate technical performance, certification, and long-term environmental benefit. Stakeholders include environmental and aviation regulatory agencies, manufacturers, including chemical agent manufacturers, airlines, and halon recyclers.

The Authority will continue to conduct regular reviews of the status of potential halon alternatives to ensure that replacement dates set by ICAO continue to be appropriate. These reviews support a

"roadmap to success" as a way forward for all stakeholders to collaborate under the auspices of ICAO. The Authority advises the aircraft manufacturers, airlines, approved maintenance organizations (AMOs), chemical suppliers and fire-extinguishing companies to move forward at a faster rate in implementing halon alternatives in engine and auxiliary power units, handheld extinguishers, and lavatories; and further investigate halon replacements for cargo compartments.