



International Civil Aviation Organization

WORKING PAPER

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ASSEMBLY — 36TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other safety matters

HALON REPLACEMENT IN CIVIL AVIATION AIRCRAFT

(Presented by the United States and the
United Nations Environment Programme's Ozone Secretariat)

EXECUTIVE SUMMARY

Although the production of halon in developed countries was banned by international agreement in 1994, it is still widely used in the aircraft industry. This paper seeks a greater global commitment toward the development of viable halon-replacement fire suppression systems for transport aircraft cargo compartments. ICAO should consider possible mandates for halon replacements that are now available, such as the installation of halon replacement in the lavatories, engines/auxiliary power units and hand-held extinguishers for transport category airplanes. Also refer to A36-WP/207-TE/64 for background information.

Action: The Assembly is invited to adopt the resolution in the attachment of this working paper.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A.
<i>Financial implications:</i>	
<i>References:</i>	

1. INTRODUCTION

1.1 For over 45 years, halogenated hydrocarbons (halons) have been practically the only fire-extinguishing agents used in civil transport aircraft. However, halon is an ozone-depleting and global warming chemical and its production has been banned by international agreement. Although halon usage has also been banned in some parts of the world, aviation has been granted an exemption because of its unique operational and fire safety requirements.

1.2 At the meeting of the parties to the Montreal Protocol in 2003, the parties tasked the United Nations Environment Programme's (UNEP) Ozone Secretariat to work with ICAO to develop a timely plan of action for the replacement of halons in civil aviation. However, there has been little success in developing and installing alternatives to halon in civil transport aircraft.

2. BACKGROUND

2.1 Information paper A36-WP/207-TE/64 provides background information on the status of research and development related to halon replacements.

3. DISCUSSION

3.1 Substantial progress has been made in the development and evaluation of practical and effective halon-replacement agents in aircraft lavatory and engine/auxiliary power-unit (APU) fire-extinguishing systems, and cabin hand-held extinguishers. However, to date only replacement agents for lavatory trash receptacles have been implemented by airplane manufacturers.

3.2 Implementation has not yet been achieved for cargo compartment fire suppression systems, which is by far the major application of halon in commercial transport aircraft, despite extensive efforts and testing in this area. It is a complex, multi-faceted fire threat and a difficult challenge. Moreover, because of the relatively large quantity of halon in cargo compartment fire suppression systems, the consequences of any agent/system change may be significant in terms of weight, cost and perhaps even maintenance, depending on the nature of the change.

3.3 Passing the Minimum Performance Standards (MPS) is only the first step toward halon replacement. Once the agent is approved, the airplane manufacturer must show compliance with additional airworthiness requirements and the airline must meet additional operational requirements. Some other items to be evaluated include, but are not limited to: the impact of the agent and system on aircraft design and performance; its compatibility with existing materials and equipment; the agent's functional characteristics; and the environmental impact of the new agent.

3.4 The future availability and accessibility of halon supplies is uncertain. To expedite the replacement of halon in the aviation industry, an international mandate is needed.

3.5 A reasonable time line could be imposed for the conversion to halon-replacement agents in lavatories, engines/APU's, and hand-held extinguishers. For lavatories and hand-held extinguishers, halon replacements should be mandatory for new production aircraft only, in order to minimize cost to the

aircraft manufacturers and operators. For engine/APUs, halon replacement could reasonably be mandated for new design aircraft with a long-term goal of transitioning the replacement agent for new production aircraft.

4. CONCLUSION

4.1 While civil aviation halon usage is likely to be a very small if not negligible contributor to stratospheric ozone depletion, the aviation community cannot ignore the likely disappearance of this agent and the expectations of the environmental community for progress in its removal. Industry and the scientific community need to redouble their efforts to find suitable replacement agents for halon in civil aircraft. In particular, a halon replacement for cargo compartments is critical.

4.2 It is recommended that ICAO consider a mandate to be effective in the 2011 timeframe for the replacement of halon in: 1) lavatories for new production aircraft; and 2) in lavatories, hand-held extinguishers, engines and APUs for aircraft for which a new application for type certification has been submitted. ICAO should also consider a mandate to be effective in the 2014 timeframe for the replacement of halon in hand-held extinguishers for new production aircraft.

4.3 For new production aircraft (i.e., airplanes which are produced after the effective date of any new requirement, e.g. current production), this timeline would allow manufacturers and operators to take the actions necessary to incorporate the product into current manufacturing operations and to allow time for design and installation approval associated with the new agents on individual airplane models and derivatives. For new designs, the transition to a non-halon alternative would be included in new design process, and the schedule would be concurrent with type certification of the new aircraft.

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APPENDIX

DRAFT RESOLUTION A36-XXX-HALON REPLACEMENT

Whereas halons contribute to climate change and are no longer being produced by international agreement because they are ozone-depleting chemicals, and have been used as fire-extinguishing agents in commercial transport aircraft for 45 years;

Recognizing that much more needs to be done because the available halon supplies are dwindling and the environmental community is becoming more concerned with the lack of substantive progress in aviation;

Recognizing that the Minimum Performance Standard for each application of halon has been developed already by the International Aircraft Systems Fire Protection Working Group with participation by industry and regulatory authorities;

Recognizing that there are stringent aircraft-specific requirements for each application of halon that must be met before a replacement can be implemented;

Recognizing that while some progress has been made in developing a halon replacement for several aspects of aircraft operation, no real progress has been made in cargo compartment halon replacement, which is by far the largest application of extinguishing agent; and

Recognizing that any halon replacement strategy must depend on alternatives that do not pose an unacceptable environmental or health risk as compared to the halons they are replacing,

The Assembly:

1. *Agrees* with the urgency of the need to develop and implement halon replacements for civil aviation;
2. *Urges* States to advise their aircraft manufacturers, airlines, chemical suppliers and fire-extinguishing companies to move forward at a faster rate in:
 - a) implementing halon alternatives in engine and auxiliary power units, handheld extinguishers and lavatories; and
 - b) investigating additional halon replacements for engines/auxiliary power units, and cargo compartments;
3. *Requests* that the Secretary General consider a mandate to be effective in the 2011 timeframe for the replacement of halon in:
 - a) lavatories for new production aircraft; and

- b) lavatories, hand-held extinguishers, engines and auxiliary power units for aircraft for which a new application for type certification has been submitted,

4. *Requests* that the Secretary General consider a mandate to be effective in the 2014 timeframe for the replacement of halon in hand-held extinguishers for new production aircraft;

5. *Encourages* ICAO to continue collaboration with the International Aircraft Systems Fire Protection Working Group and the United Nations Environment Programme's (UNEP) Ozone Secretariat through its Technology and Economic Assessment Panel's Halons Technical Options Committee on the topic of halon replacement for civil aviation, and

6. *Resolves* that the Secretary General shall report to the next Ordinary Session of the Assembly on progress made with halon replacements in civil aviation.

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