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FAA Technical Center
Atlantic City International Airport,
NJ 08405

User Preferred Fire Suppression Agent for Lavatory Trash Container Fire Protection

April 1996

Final Report of Lavatory Trash Receptacle Fire
Suppression Agent Preference Task Group of the
International Halon Replacement Working Group

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EXECUTIVE SUMMARY

The results of the survey sent to airlines and airframe manufacturers on Lavatory Trash Receptacle Fire Suppression Agent Preference are compiled in this report. Tests are recommended to define the quantity of water required for fire extinguishment.

BACKGROUND

At the meeting of the International Halon Working Group held in Rome, April 1995, a suggestion was made and accepted to query the airlines as to an acceptable/preferred firefighting agent for use in the lavatory trash receptacle. As a direct result of this suggestion, a Task Group was formed that prepared a package, including background information and a questionnaire, for querying the airlines on their preference for a replacement agent for Halon 1301 in lavatory trash receptacle extinguishers. The survey package is shown in appendix A. A list of the task group members is shown in appendix B. The complete package was sent out by the FAA Technical Center to airlines, airframe manufacturers, and aviation authorities throughout the world. At the follow-on meeting held in Albuquerque, New Mexico, July 1995, Task Group members agreed to review the returned surveys and reach a consensus on how to report the results.

SURVEY RESULTS

A summary of the responses from those airlines who completed the questionnaire is shown in table 1.

Sixteen respondents (66%) listed halocarbon and/or a halocarbon blend as the preferred agent with reasons given as weight, minimum impact on current installation, and effectiveness in suppressing/extinguishing the fire threat. The downside mentioned was halocarbon's global warming potential (GWP).

Four respondents (16%) preferred water. The reasons given were it is environmentally friendly and less maintenance is required. The negatives given were the weight and questions as to its effectiveness.

Three additional comments were received questioning the selection of 33°F as the minimum operational temperature in the standard. Each of these comments suggested that the temperature should be lower, with one suggestion of 0°F as a more appropriate value.

RECOMMENDATIONS

Perform the test procedure defined in the Minimum Performance Criteria for Replacement of Lavatory Disposal Receptacle Built-in Fire Extinguisher to determine the amount of water required to satisfy the minimum performance standard. This would allow for a more fully defined water-based system to be evaluated.

TABLE 1. RESPONSES TO SURVEY: USER PREFERRED AGENT FOR LAVATORY TRASH
CONTAINER FIRE PROTECTION (Continued)

Company	Name	Preference			Comments
Hawaiian Airlines		Halocarbon and Blends	Water and Water Based		
Japan Airlines					Safe to humans and nature, easy clean up, availability, consistent w/other a/c agents.
Lufthansa		Halocarbon (HFC-227 ea)	Water		Water would be favorite if a simple reliable system were developed.
Philippine Airlines		Water and Water Based	Halocarbon and Blends		Water poses less maintenance is environmentally friendly.
Qantas Airways					Any replacement should be drop-in, gaseous preferred.
SAS		Water and Water Based			Fluorocarbons have high GWP, not accepted by environmentalists in Scandinavia.
SIA Engineering Co.		Water and Water Based			
Southwest Airlines ⁽¹⁾		Halocarbon and Blends	Water and Water Based		Due to problems inherent to both, keep looking.
Swissair ⁽¹⁾		Halocarbon and Blends	Self Extinguishing Container		Low operating temp concern. Halocarbons seems to be perfect solution, Investigate container technology.
Transworld Airlines		Halocarbon and Blends	Water and Water Based		Halocarbon - superior fire suppression, less maintenance and volume.
United Airlines					Are powder/foam agents being tested?

⁽¹⁾Received when Notice was in the Draft format.
Sent out by FAA TC to over 50 interested parties.

APPENDIX A

SUPPLEMENTARY INFORMATION/SURVEY

APPENDIX A

**USER PREFERRED FIRE SUPPRESSION AGENT FOR LAVATORY
TRASH CONTAINER FIRE PROTECTION**

ORGANIZATION: International Halon Replacement Working Group
Task Group-. User Preferred Agents for Lavatory Trash Containers

SUMMARY: This notice requests information from the user community on agent(s) that would or would not be considered for use in lavatory trash containers fire suppression systems. This information is requested to help guide the FAA in development of airworthiness criteria for the evaluation of non-halon fire suppression agents/systems.

DATES: Comments must be received by 30 June 1995.

ADDRESSES: Comments on this notice should be sent to:

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Task Group User Preferred Agents
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FOR FURTHER INFORMATION CONTACT:

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Bud Roduta	United Airlines
John O'Sullivan	British Airways
John Blackburn	AVRO
Greg Grimstad	Boeing

SUPPLEMENTARY INFORMATION: At the fifth meeting of the International Halon Replacement Working Group (IHRWG), held 19-20 April 1995, in Rome, Italy, a Task Group was formed to determine the aviation industry's preferred fire suppression agent for use in lavatory trash containers. This information will serve to reduce the list of potential candidate agents and thus assist the regulatory authorities in planning their research activities to serve the aviation industry in an effective and timely manner.

Discussion of trash container fire suppression

Fire protection requirements and characteristics of potential replacement agents are discussed in the next several sections.

Regulations

Federal Aviation Regulation FAR DOT 14CFR 121.308(b) requires that, "After April 29, 1987, no person may operate a passenger carrying transport category airplane unless each lavatory in the airplane is equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste located within the lavatory. The fire extinguisher must be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in the receptacle."

Present practice

Currently all aircraft lavatory disposal receptacle fire extinguishers use Halon 1301 as the fire suppression agent. The agent is contained in a pressurized bottle to which is connected a delivery tube and a nozzle. The bottle automatically discharges at a sense temperature in the range of 170°F- 175°F. This system is commonly referred to as a potty bottle.

International Halon Replacement Working Group (IHRWG)

The goal of the International Halon Replacement Working Group, is to introduce non-halon fire suppression systems into service in a timely, cost effective manner, with no compromise in safety. The Group is working all areas of fire protection onboard aircraft: engines and auxiliary power unit, cargo compartments, hand-held fire extinguishers for the occupied area, lavatory trash container, and dry bay (military). The IHRWG has formed several Task Groups to conduct specialized studies. Studies applicable to trash container fire suppression are:

- (1) Chemical Options to Halons for Aircraft Use, Published by the FAA as DOT/FAA/CT-95/9. (Task Group 6).
- (2) Proposed Methodology for Lavatory Disposal Receptacle Built-in Fire Extinguisher Agent Evaluation (Task Group 7).

The above two reports are in public domain and are available from the FAA Technical Center, New Jersey. [Contact Ms. April Homer, Phone 609-495-4471, Fax 609-646-5229].

At the April meeting it was suggested that the end users be queried as to any preference for the agents recommended by Task Group 6. These agents are:

- (1) water and water based agents, and
- (2) halocarbon and halocarbon blends.

There are several agents in each of these two classes and each agent/class has its pros and cons. Several members of the IHRWG commented at the Rome meeting that they would or would not

however, the lower these values the better. All agents listed are acceptable to the U.S. Environmental Protection Agency.

The design concentrations shown in Table A-1 are for extinguishment of Class B fires using n-heptane as fuel, rather than the Class A (paper) fire that would be expected in a trash container. Therefore, the design concentrations listed are not directly applicable to the expected threat and are provided for information purposes only. Tests have not been performed, for the potential threat, using all the listed halocarbons and relevant data is not available.

[Walter Kidde Aerospace has performed some preliminary tests using FM-200 and have reported fire suppression performance equivalent to that of Halon 1301 with approximately 0.291 pounds (132 grams) of the agent. These tests were done by using the same size bottle as the current Halon 1301 configuration.]

Halocarbons are non-toxic, see LOAFEL and NOAEL values in Table A-1. The halocarbon bottle maintenance requirements can be reasonably assumed to be the same as the present Halon 1301 system.

**International Halon Replacement Working Group
User Preferred Agent for Lavatory Trash Container - Questionnaire**

Name: _____ **Fax:** _____

Company: _____ **Tel:** _____

A) Two agent categories (water/water based and halocarbon/halocarbon blends) have been identified for lavatory trash container fire suppression.

Please list in order of preference and/or identify an alternative.

1. most desired, 4. least desired

Additional comments are encouraged, attach pages as required.

If you have no preference, skip to B).

1. _____

2. _____

3. _____

4. _____

B) Comments or suggestions, (attach additional pages as required).

C) Please return, by mail or fax, on or before 12 July 1995

Mail: Boeing Commercial Airplane Group

P.O. Box 3707 M/S 6H-PW

Seattle, WA USA 98124-2207

Attention: Greg Grimstad

Fax: 206 237 4831

APPENDIX B

LIST OF TASK GROUP MEMBERS

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LIST OF TASK GROUP MEMBERS

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