A Study on the Quality Control Process of Fire Extinguishing and Suppression Agents

Background

- **Instances of contaminated Halons (in handheld extinguishers) installed on aeroplanes**
- **Questions re. adequacy of existing processes to assure that extinguishing/ suppression agents meet applicable purity standards**
- **ICAO recommendation for better oversight of the quality compliance of re-cycled Halons**

Study Objective

- **Broadly:**

  Explore means to minimize the probability that 'contaminated' extinguishing/ suppression agents will be installed on aircraft

- **Specifically:**

  Investigate the processes/procedures currently in use to control the quality of agents (in North America and Europe)

Study being conducted under contract to Transport Canada in partnership with FAA and UK CAA (in cooperation with EASA)

Status

Study Completed

Information received from 38 organizations:

- Agent manufacturers
- Recycling organizations
- Test Laboratories
- Equipment/Component manufacturers
- Aircraft manufacturers
- Maintenance/Repair/Overhaul organizations
- Operators
- Accreditation organizations
- Trade associations

Consideration

- Extinguishing and suppression agents
- New and recycled agents
- Accidental as well as intentional non-compliance/contamination ‘opportunities’
- Minimising nugatory activities and regulatory burden

Findings

- **No direct oversight of Agent Manufacturers by the Airworthiness Authorities. ULC/UL oversight in North America.**
- **Multiple Test Analysis/Certification conducted on same batch of agent**
- **Some limited new build filling of extinguishers by organisations other than the manufacturer.**

Findings

- **No on-aircraft charging of fire extinguishers or suppression systems. Equipment is installed as a discrete unit and is maintained by replacement.**

- **Equipment refill with Agent and subsequent certification reliant on Component Maintenance Manual (CMM)**

Findings

- **Test certificates may cover bulk holding rather than specifically the drawn down batch of agent.**

- **Test Laboratories may rely on samples taken by the client rather than their own technicians**

Findings

- **UL oversight not provided for equipment maintenance/refill activities.**

- **Handheld fire extinguishers may be fitted under US regulation without an airworthiness release. (Reliance on UL tag)**

Principle Recommendation 1

- **It is recommended that the obligation to control and confirm the acceptability of agent (whether new or recycled), which is contained in the equipment should fall to the original equipment manufacturer, or any other organisation responsible for filling of equipment with the relevant agent, including the requirement for analysis and a test certificate for the agent to be issued from an accredited test laboratory.**

Principle Recommendation 2

- **Organisations undertaking the filling of other manufacturers' equipment should have the same level of Authority or UL/ULC oversight as the equipment manufacturer.**

Principle Recommendation 3

- **There should continue to be no requirement for agent manufacturers to have any specific Authority accreditation.**

Principle Recommendation 4

- **Test laboratories should be appropriately accredited directly by the Authorities or by a nominated organisation on their behalf, such as UL/ULC.**

Principle Recommendation 5

- **Each batch (container) of agent intended for filling of equipment should have a discrete test certificate.**

Principle Recommendation 6

- **A review should be conducted to establish whether the specification for Halon purity required by the standards is unnecessarily stringent for airworthiness considerations, in particular the water contamination limit of 10ppm. This may enable more efficient recycling of Halon reserves, with particular benefit to hand held fire extinguishers.**

Principle Recommendation 7

- **For the purposes of quality control, agent supplied from an agent manufacturer or recycling organisation should be processed as if it were potentially contaminated prior to the securing of a test certificate by the equipment manufacturer, certifying purity against the relevant Standard specification.**

Principle Recommendation 8

- **Consideration should be given to requiring hand held fire extinguishers that are to be fitted on US registered aircraft to carry an FAA 8130-3 or equivalent airworthiness release as opposed to any current reliance on a UL tag only.**

Principle Recommendation 9

- **The most desirable situation is that a Form 1/FAA 8130-3 or equivalent airworthiness release be provided with all fire extinguishing and suppression equipment, providing reference to the test certificate issued by the accredited test laboratory, for the batch of agent used, even where UL/ULC oversight is being conducted.**

Principle Recommendation 10

- **If a requirement for a Form 1/FAA 8130-3 or equivalent airworthiness release is not to be imposed on all supplies of fire extinguishing and suppression equipment to the aviation market, consideration should be given to extension of UL oversight to surveillance of equipment maintenance activities on fire extinguishers and fire suppression equipment, where appropriate.**

Principle Recommendation 11

- **The European Authorities should consider whether surveillance of approved organisations involved in the manufacture of fire extinguishers in particular achieves the same level of control as that provided under the ULC/UL scheme in North America.**

RECOMMENDATIONS WITH THE AIRWORTHINESS AUTHORITIES FOR CONSIDERATION

COOPERATION OF PARTICIPANTS MUCH APPRECIATED