Australian Government
Civil Aviation Safety Authority

AIRWORTHINESS BULLETIN

Incendiary Dispensing Device

AWB 25-022 **Issue** : 2
Date : 5 November 2013

1. Applicability

Australian registered aircraft operations utilising Incendiary Dispensing Device.

2. Purpose

To provide guidance on design considerations for Incendiary Dispensing Device carried in aircraft for aerial fire fighting.

3. Background

An Incendiary Dispensing Device should meet the operating principles set out in Paragraph 4 of this AWB. Such devices are role equipment, and are the responsibility of the operator as outlined in the following points:

- Any item of equipment (operational and/or emergency) that is installed in an aircraft as part of aircraft's type design or approved modification (aeronautical products) must be maintained in accordance with the applicable instructions for continuing airworthiness issued by the designer of the aircraft, the modification or aeronautical product and be incorporated into the aircraft's maintenance program/system of maintenance. Such maintenance should be carried out by appropriately qualified personnel in an appropriate facility.
- Any other items of equipment fitted to, or carried on board, the aircraft not covered by an approved design should not adversely affect the safe operation of the aircraft while the equipment is operating or dormant. It is the responsibility of the operator to assess the risk associated with normal operation and any malfunction and failure of such equipment.
- The operator needs to take appropriate action to mitigate any identified risk that would adversely affect the safe operation of aircraft. The risk mitigation method may include flight manual supplements, trained operators and regular maintenance of the equipment in accordance with the manufacturer's recommendations.

This AWB, 25-022 Issue 2, broadens the design considerations for the carriage and replenishment of associated stores with minor editorial changes also introduced throughout the text

4. Recommendations

An Incendiary Dispensing Device should include the product features that satisfy the defined operational principles that follow.

Item	Product Feature	Operating Principle
1	Ignition Device	Spherical or semi spherical capsule containing no more than 3.5 grams of Potassium Permanganate (KMn04). (See Note I.).
2	Ignition Source	Initial exothermic reaction between Potassium Permanganate (KMn04) and Ethylene Glycol (antifreeze). The chemical reaction must be safely contained within the device to be deployed, for such time required for safe deployment.
3	Dispensing System	The equipment must be self contained and controllable at all times by the Incendiary Device Operator, and capable of ensuring: a. automated transfer of the ignition device from the feed system, b. initiation of initial chemical reaction, c. ejection and separation of the ignition device from the aircraft, and d. Ejection and dispensing rates of the ignition device from the aircraft.
4	Feed System	The feed system must be capable of: a. containing the unprimed ignition device at all times during the operation b. Being isolated, separated or sealed from dispensing system.
5	Drop Tube	The drop tube must ensure safe vertical ejection of the ignition device from the aircraft and be able to be cleared of jammed device when required.
6	Fire Extinguishing System	The fire extinguishing system must be accessible to the Incendiary Device Operator at all times and must consist of: a. a water system which can be sprayed directly onto and into the equipment where fire may be located, b. an additional aircraft mounted fire extinguisher, and c. A fire blanket mounted in the aircraft and within reach of the Incendiary Device Operator. The modification for the aircraft mounting device required for the fire extinguisher must have been approved by CASA or an authorised person approved under regulation 35 or Sub Part 21M of the CASR 1998.

7	System Safety Features	The Incendiary Dispensing Device must have built in safety features which: a. control the injection of the ignition device in a manner which ensures only one (1) device is injected and dispensed at any time, b. allows isolation of the feed tube system, c. has a fire extinguisher system, d. allows clearing of jams e. allows the operator to know if an ignition device has not been ejected from the aircraft, and f. Allows a rapid ceasing of the operation of the system when required by the Incendiary Device Operator.
8	Dispensing System Liquids	Liquids to be used for the Dispensing System must only be stored in appropriate containers designed for the purpose. All Ethylene Glycol (antifreeze) containers to be carried must remain isolated from associated stores of Ignition Devices at all times. Filling or replenishing the Ethylene Glycol (antifreeze) tank for the IDD system must not be undertaken during any flight phase. Any externally mounted Ethylene Glycol (antifreeze) or Water containers must be of a size which allows them to be securely and safely stowed in the aircraft when not in use and during take off, landing or any emergency situation. Container Capacities: Antifreeze - Internally mounted tanks a maximum of 35 litres - Externally mounted tanks a maximum of 3 litres Water - Internally or Externally mounted tanks a maximum of 3 litres. The modification for aircraft mounting device required for the containers (Internal or External) must have been approved by CASA or an authorised person approved under regulation 35 or Sub Part 21M of the CASR 1998.
9	Power Supply	The power supply for the Dispensing System may consist of an electrical or compressed air source or combinations thereof, but in all cases it must be: a. sufficient to ensure the safe operation of the unit, and

		b. Incapable of interfering with the operation of any of the aircraft's normal or emergency systems.
10	System Mounting	The Incendiary Dispensing Device and its associated system must be mounted and secured in the aircraft in a manner which complies with CAR 35, CASR 21M, CAR 235 and CAO 20.16.2, as applicable.
11	System Weight	The weight of the Incendiary Dispensing Device and its associated stores (liquids, reactive agents, ignition devices) must be made known to the pilot.

Notes

I. Potassium permanganate (KMnO4) is a strong oxidizer and will react violently with certain chemicals. The following compounds must be isolated from the KMnO4 during shipping and storage;
Antimony, Aluminium Carbide, Arsenic, Ethylene Glycol, Glycerol, Hydrogen Trisulphide, Hydrogen Peroxide, Phosphorous, Sulphur Sulphuric Acid and Titanium.

For additional information refer to the Material Safety Data Sheets (MSDS) for the product.

5. Reporting

Any deficiencies in the product features or operational principles of an Incendiary Dispensing Device shall be notified to CASA by the Service Difficulty Reporting (SDR) process.

6. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link e-mail address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

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