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AEROSPACE RECOMMENDED PRACTICE

ARP5058

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Submitted for recognition as an American National Standard

ENCLOSED OPERATOR'S CABIN FOR AIRCRAFT GROUND DEICING EQUIPMENT

1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) is intended to establish guidelines and design requirements for an enclosed cabin for both mobile deicers and fixed deicing equipment. The enclosed cabin is located at the end of the deicing boom.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

ARP1247	General Requirements for Aerospace Ground Support Equipment Motorized and Nonmotorized
ARP1558	Interface Protective Devices - Ground Equipment to Aircraft
ARP1838	Pictograms for Ground Support Equipment
ARP1971	Aircraft Deicing Vehicle - Self-Propelled, Large Capacity
ARP4047	Aircraft Deicing Vehicle - Self-Propelled, Small Capacity
ARP4737	Aircraft Deicing/Anti-icing Methods with Fluids, for Large Transport Aircraft
AMS 1424	Aircraft Deicing/Anti-icing Fluid, Aircraft, SAE Type I
AMS 1428	Aircraft Deicing/Anti-icing Fluids, Non-Newtonian, Pseudo-Plastic, SAE Type II

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2.1.2 ANSI Publications: Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI A92.2 Vehicle-Mounted Elevating and Rotating Aerial Devices

2.1.3 OSHA Publications: Available from OSHA, 200 Constitution Avenue NW, Washington, DC 21210.

Safety and Health Standards 29 CFR 1910

3. TECHNICAL REQUIREMENTS:

3.1 General Description:

The enclosed cabin involves an ergonomic design wherein a typical operator's open basket is replaced by an enclosed cabin located at the end of the deicing boom. The design allows the operator to effectively apply deicing/anti-icing fluid to the upper areas of aircraft control surfaces, wings, empennage and fuselage and offers protection from jet blast, fumes, fluid spray, and weather.

3.2 Basic Performance Features:

3.2.1 The primary function shall be to allow an operator to be in an enclosed cabin while applying heated water and/or deicing/anti-icing fluid mixtures from a variable height boom to the surfaces of stationary aircraft.

3.2.2 The cabin shall be capable of accommodating:

a. Single Operator Cabin: Minimum 113 kg (250 lb) lift capacity
b. Dual Operator Cabin: Minimum 204 kg (450 lb) lift capacity

3.3 Enclosed Cab Description:

3.3.1 The cabin and its installation on the boom must conform to all national safety, structural, and stability requirements in all respects other than electrical insulation requirements. If provided, leveling hydraulic cylinder(s) shall be equipped with pilot operated check (or holding) valves bolted directly to the base of the cylinders to prevent inadvertent cabin movement from a hydraulic system pressure loss. All pivot points shall have easily accessible grease fittings. The cabin shall have a self-adjusting mechanism to maintain a vertical attitude for all boom positions.

3.3.2 The deicing/anti-icing equipment and boom shall remain stable in all operating positions. See also ARP1971, ARP4047, and ARP1247.

3.3.3 Stability and safety shall be paramount in the cabin design.

3.3.4 The cabin shall be equipped with a complete set of controls which will permit the operator to move the boom and cabin through any of its motions allowed by the boom design. Operation of the controls shall be smooth and positive.

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3.3.5 All control levers shall directionally agree with cabin movement as much as practical. Boom controls shall be of the “dead-man” type. Control levers shall be identified with permanent nonfading pictograms per ARP1838 or placards with descriptive wording.

3.3.7 A nonmarking rubber bumper shall be installed on the external bottom and bottom edges of the cabin.

3.3.8 The cabin shall be provided with safe entry and exit with positive latches and “suitable hand holds” on entry door. This door shall permit easy entry of an average sized operator dressed in winter protective clothing. The inside door handle is to be easily accessible for the seated operator.

3.3.9 A two-way headset communication system shall be installed in the cabin for two-man deicing vehicles. It should have independent volume control and should provide continuous, hands free two-way communication.

3.3.10 A heater shall be provided with adjustable temperature control, adjustable fan speed, and window defrosting capabilities using multiple heat ducts.

3.3.11 The cabin shall include a cushioned seat with a full back. A safety belt or safety harness shall be permanently attached to the cab structure.

3.3.12 The cabin shall be equipped with a minimum of four external 50 W or greater capacity weatherproof sealed beam floodlights on universal mounts with a control switch located in the cabin for night operations. A weatherproof spotlight of 50 W or greater capacity shall be mounted directly to the nozzle with a control switch located in the cabin. An interior dome light and control panel lights shall be provided to illuminate inside the cabin.

3.3.13 Windows shall be provided on all four sides and shall provide a downward view. The rear window shall be capable of being opened for outside air ventilation or some other suitable ventilation system shall be included. The operator in a seated position shall have visibility in all directions. The operator shall have view of the aircraft being deiced, boom and boom base at ground level in all elevated positions. The window material shall be safety glass or an abrasion resistant polycarbonate material.

3.3.14 The front and side windows shall be equipped with wipers that have individual controls. A washer system shall be included with a minimum of 7 L (2 gal) reservoir(s) capacity.

3.3.15 The cabin interior shall include insulation and finish trim where possible. The floor shall be covered with a nonskid material. The cabin shall be weather tight with no leakage of fluid around door edges, hinges, and access panels.

3.4 Fluid System Description:

3.4.1 The fluid plumbing on the enclosed cabin shall be in compliance with the fluid handling system of ARP1971 and ARP4047.

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3.4.2 The spray pattern shall be remotely operated and conform to ARP1971, 3.5.10.

3.4.3 The spray nozzle shall be remotely operated and positioned in front of the cabin. It shall also be retractable or stowable to minimize the projected length with adequate protection from damage when at rest. The spray nozzle shall pivot on a vertical axis at least 25° upward and 60° downward from centerline of the cabin. It shall also pivot on a horizontal axis at least 90° right and 90° left from centerline of the cabin. The vertical and horizontal motions shall be independently controlled and operated. The spray nozzle shall be controlled by a joystick where the position of this joystick corresponds to the position of the nozzle.

If equipped with Type I and Type II anti-icing systems, the same nozzle or adjacent nozzles shall be used which are suitable for these systems. If a single nozzle is used the fluid selection system shall include mechanical and/or electrical interlock devices to prevent fluid contamination between the two fluids. The fluid selection system shall also include an indicator light for each selectable fluid.

3.4.4 The deicing/anti-icing fluid system shall conform to ARP1971 and ARP4047.

3.5 Protective Equipment and Safety Devices:

3.5.1 Access must be provided for servicing and changing components. Panels and doors must be securely fastened to withstand jet blasts.

3.5.2 All exposed edges (corners) of the body shall be radiused in accordance with standard manufacturing practices recognized in the automotive truck industry.

3.5.3 All steps and platforms shall have a nonskid self-draining surface.

3.5.4 The cabin shall be equipped with an emergency system to enable the operator to lower the cabin into the normal stowed position; in the event of a malfunction or shutdown of the primary hydraulic system.

3.5.5 The cabin shall be equipped with an emergency stop switch that will shut down the main control system.

3.6 Optional Equipment:

3.6.1 Fluid Pressure Gauge: A fluid pressure gauge shall be provided within the cabin giving pressure of the fluid exiting the nozzle.

3.6.2 Fluid Temperature Gauge: A fluid temperature gauge shall be provided within the cabin giving temperature of the fluid exiting the nozzle.

3.6.3 Ice Detection System: Provisions shall be made for mounting an ice detection system's sensors, displays, instrumentation, and controls.

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