Australian Government
Civil Aviation Safety Authority

PROTOCOL

(OPS.22) Aircraft ground de-icing / anti-icing program

June 2024

Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Inside front cover artwork: James Baban.

1. Purpose

This protocol is for the assessment of a ground de-icing/anti-icing program. The purpose of a de-icing/anti-icing program is to effectively remove and/or prevent the accumulation of frost, snow, slush, or ice contamination, which can seriously affect the aerodynamic performance and controllability of the aircraft. This protocol enables standardisation of the assessment process.

2. Concept and philosophy

Safe aircraft operations during all types of weather conditions are of utmost concern to all air transport and aerial work operators. A review of the history of aircraft accidents in the air transportation industry revealed that a substantial number are related to weather conditions, specifically winter operations. An examination of these accidents showed a need for formally developed regulations and procedures governing aeroplane de-icing/anti-icing operations, directed towards all sectors of aviation, including:

- aeroplane manufacturers
- airline operators
- engineering, maintenance and service organisations.

Wind tunnel and flight tests indicate that ice, frost or snow formations on the leading edge and upper surface of a wing, having a thickness and surface roughness similar to medium or coarse sandpaper, can reduce wing lift by as much as 30% and increase drag by up to 40%. These changes in lift and drag significantly increase stall speed, reduce controllability and alter aeroplane flight characteristics. Thicker or rough ice accumulation in the form of frost, snow, or ice deposits can have increasing effects on lift, drag, stall speed, stability and control, but the primary influence is surface roughness relative to critical portions of an aerodynamic surface. Ice on critical surfaces and on the airframe may also break away during take-off and be ingested into engines, possibly damaging fan and compressor blades. Ice forming on pitot tubes and static ports or on angle of attack vanes may give false attitude, airspeed, angle of attack and engine power information for air data systems. It is therefore imperative that take-off not be attempted unless it has been ascertained that all critical surfaces of the aeroplane, as well as all instrument probes, are free of adhering snow, frost or other ice formations. This vital requirement is known as the 'clean aircraft concept’.

3. Process

All administration tasks should follow standard regulatory service administration procedures (as applicable), in addition to the following:

a. For an initial issue or variation to an air transport air operator's certificate (AOC), operators will submit the Air Operator’s Certificate / Associated Approvals form (CASA-04-5515) to CASA for an approval under regulation 119.065 or 119.090.

b. For an initial issue or variation to an aerial work certificate (AWC), operators will submit the Aerial Work Operations form (CASA-04-5505) to CASA for an approval under regulation 138.035 or 138.062.

c. Regservices will create a case in EAP to be assigned to both an airworthiness inspector (AWI) and flight operations inspector (FOI).

d. All associated CASA staff must be knowledgeable of, and competent with, Principle (OPS.22) Aircraft ground de-icing/anti-icing program which provides details of the assessment.

e. The relevant sections of Worksheet (OPS.22) must be completed by the AWI and FOI and saved as a PDF document in RMS, including:

   i. the assessment summary

   ii. the approval data sheet.

f. If the application is a significant change, the inspector must complete the approval data sheet and provide the revision details for the exposition/operations manual.

g. The inspector must complete EAP in accordance with the EAP OAS Case Management - Regulatory Oversight Division (ROD) handbook (CASA-03-5501).

4. List of supplements

Only the following supplements may be used in support of this protocol. The most recently approved versions will be found on the CASA intranet website. Approved forms are located on CASA's external website.

- Principle (OPS.22) - Aircraft ground de-icing/anti-icing program
- Worksheet (OPS.22) - Aircraft ground de-icing/anti-icing program

5. Scope

This protocol is for the assessment of an operator's exposition/operations manual to ensure:

- if frost or freezing conditions occur—the operator has suitable procedures for the inspection of the aircraft before flight
- if ground de-icing and ground anti-icing measures are required for the flight—the operator has suitable procedures for carrying out these measures before the flight.

6. Competency requirements

To conduct the assessment, inspectors must have successfully completed the foundation training and advanced regulatory assessment training programs.

The assessment must be conducted by both an FOI and AWI.

Inspectors assessing de-icing/anti-icing operations should be well versed in the ICAO requirements described in ICAO Document 9640.

7. Associated legislation

Table 1. Legislation associated with this protocol

Document	Title
Part 11 of CASR	Regulatory administrative procedures
Part 91 of CASR	General Operating and Flight Rules
Part 119 of CASR	Australian air transport operations – certification and management
Part 121 of CASR	Australian air transport operations – Larger aeroplanes
Part 133 of CASR	Australian air transport operations – Rotorcraft
Part 135 of CASR	Australian air transport operations – Smaller aeroplanes
Part 138 of CASR	Aerial work operations

8. Guidance references

Table 2. Guidance material relevant to this protocol

Document	Title
SAE AS 6285	Aircraft Ground De-icing/Anti-icing Processes
SAE AS 6286	Aircraft Ground De-icing/Anti-icing Training and Qualification Program

9. ICAO references

Table 3. ICAO references applicable to this protocol

Document	Title
9640	Manual of Aircraft Ground De-icing/Anti-icing Operations

10. Revision history

Amendments/revisions of this protocol are recorded below in order of most recent first.

Table 4. Revision history table

Version No.	Date	Parts/Sections	Details
1.1	June 2024	All	Reformat to latest template
1.0	November 2022	All	First issue