REPORTING SYSTEM(S).


B. SAS. For 14 CFR parts 121 and 135 CHs, use SAS automation and the associated Data Collection Tools (DCT).

OBJECTIVE. This section provides guidance for the Principal Maintenance Inspector (PMI) in assisting the Principal Operations Inspector (POI) in evaluating for approval proposed deicing/anti-icing programs.

GENERAL. The current regulations in parts 121, 125, and 135 are based on the “clean aircraft” concept. These regulations prohibit a takeoff with frost, ice, or snow (contamination) adhering to the wings, control surfaces, or propellers of an airplane. Part 121, § 121.629; part 125, § 125.221; and part 135, § 135.227 require that each part 121/135 operator that conducts operations under conditions that may produce frost, snow, or ice accumulation must have one or both of the following:

- An approved aircraft deicing program.
- An inspection program that ensures that aircraft are free of any accumulation of frost/ice/snow before takeoff.

A. Approval Process. The approval of an operator’s deicing/anti-icing program involves the following steps:

1) Reviewing the Operator’s Program Submission. Both the PMI and the POI initially review the proposed program to ensure that all required elements have been submitted. After the PMI and the POI are satisfied that all of the required elements are suitably addressed, they will distribute copies of the program to all involved aviation safety inspectors (ASI).

2) Evaluating the Operator’s Program Submission. Conduct a detailed analysis of the proposed program, training, equipment, and facilities.

3) Validation Testing. Validate the operator’s performance during actual operations.

B. Issuance of Operations Specifications (OpSpecs). At the conclusion of the process, the POI with primary responsibility for this job task will issue the OpSpecs. The OpSpecs
authorize the operator to conduct operations under the program in ground icing conditions in which frost, ice, or snow may reasonably be expected to adhere to the operator’s aircraft.

C. Provisions and Exceptions. Section 121.629(d) includes an exception to the requirements for a complete deicing/anti-icing program. This section provides that an air carrier is not required to have an approved deicing/anti-icing program if an Outside-the-Aircraft Check (OTAC) is completed within 5 minutes before beginning the takeoff. An OTAC must be performed from outside the aircraft to ensure that the “wings, control surfaces, and other critical surfaces are free of frost, ice, and snow” when the CH is operating in ground icing conditions. If a CH chooses to operate in accordance with § 121.629(d), the requirement for an OTAC must be contained in its OpSpecs.

D. Use of Infrared Deicing Facilities. An operator wishing to use an infrared deicing facility should ensure that the infrared deicing system used by that facility meets the criteria presented in this section or provides an alternative, acceptable means of assuring the operational safety of the deicing facility. Once an operator has determined that the infrared deicing system to be used by a deicing facility meets the criteria presented in this chapter, the operator should present their findings to their responsible Flight Standards office for review. Once the Federal Aviation Administration (FAA) determines, from the findings presented, that the infrared deicing system meets all criteria, then the system may become part of the operator’s ground deicing/anti-icing program. Operators should use the following criteria for approving the use of infrared deicing systems:

1) The operator should create an appropriate description of the system: hardware, energy source, markings, etc. In addition, the operator should ensure that:

   a) The infrared deicing system performs its intended purpose (i.e., it effectively deices an aircraft).

   b) The operation of infrared deicing systems does not create a hazard to:

      • Aircraft;
      • Ground personnel, as determined by appropriate Occupational Safety and Health Administration (OSHA) standards;
      • Crewmembers;
      • Passengers;
      • Cargo (sensitive materials, plants, animals, etc.); or
      • Airport facilities (navigational aids, antennas, communication facilities, buildings, etc.).

   c) The infrared system submitted for approval is in agreement with appropriate industry standards as created by groups such as: SAE International (SAE), the International Organization for Standardization (ISO), and FAA documents.

2) The method for approving the operational use of an infrared system should follow established guidelines set by industry groups, such as SAE, ISO, Airlines for America (A4A), the
International Civil Aviation Organization (ICAO), and the General Aviation Manufacturers Association (GAMA). These guidelines should address:

- The training of flightcrew, infrared equipment ground operator personnel, facility maintenance personnel, and deicing/anti-icing ground personnel;
- The temperature of the aircraft surface, including thermal cyclic loading, thermal stresses, and temperature extremes;
- Melted ice flowing into aerodynamically quiet areas and refreezing;
- Additional deicing and anti-icing requirements; and
- Environmental considerations.

E. Alternative Methods of Deicing. Given the cost of deicing with conventional fluids and the recent demand for alternative deicing methods, interest in infrared deicing systems has increased. The FAA encourages the development and use of alternative methods of deicing such as infrared systems; however, it is necessary to ensure that infrared deicing systems are used with the highest degree of safety. Consequently, the FAA has developed general safety criteria for operators and inspectors to use in evaluating and approving the use of infrared deicing systems in an operator’s deice/anti-ice program.

F. Infrared Deicing Facility Criteria. An operator wishing to use an infrared deicing facility should ensure that the infrared deicing system used by that facility meets the criteria, or provides an alternative, acceptable means of ensuring the operational safety of the deicing facility.

3-2239 DEFINITIONS.

A. Pretakeoff Check. A pretakeoff check is a check of the aircraft’s wings or representative aircraft surfaces for frost, ice, or snow during the aircraft’s holdover time (HOT).

B. Pretakeoff Contamination Check. A pretakeoff contamination check is conducted by the flightcrew and ground personnel after exceeding the HOT. They conduct this check to make sure that the wings, control surfaces, and other critical surfaces, as defined in the operator’s program, are free of frost, ice, and snow. The pretakeoff contamination check must be completed within 5 minutes before beginning the takeoff.

C. Outside-the-Aircraft Check (OTAC). Section 121.629(d) requires an OTAC of a CH who operates in ground icing conditions without an approved part 121 ground deicing/anti-icing program. For those operators without an approved program, if frost, ice, or snow may reasonably be expected to adhere to the aircraft, an OTAC must be performed to ensure that the wings, control surfaces, and other critical surfaces are free of contamination. An OTAC must occur within 5 minutes before beginning the takeoff.

D. HOT. HOT is the estimated time for which deicing/anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the treated surfaces of an aircraft. HOT begins when the final application of deicing/anti-icing fluid starts and ends when the applied deicing/anti-icing fluid loses its effectiveness.
3-2240 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Knowledge of the regulatory requirements of part 121, 125, or 135, as applicable; and
- Successful completion of appropriate Airworthiness Indoctrination course(s).

B. Coordination. This task requires coordination with POIs and the operator.

3-2241 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Advisory Circular (AC) 00-45, Aviation Weather Services.
- AC 20-73, Aircraft Ice Protection.
- AC 91-79, Mitigating the Risks of a Runway Overrun Upon Landing.
- AC 120-58, Pilot Guide Large Aircraft Ground Deicing.
- AC 120-60, Ground Deicing and Anti-Icing Program.
- AC 135-9, FAR Part 135 Icing Limitations.
- AC 135-16, Ground Deicing and Anti-Icing Training and Checking.
- AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area.
- Volume 3, Chapter 27, Ground Deicing/Anti-Icing Programs.
- Volume 4, Chapter 3, Section 5, Safety Assurance System: Selected Practices.

NOTE: Numerous videos have been produced by manufacturers of deicing/anti-icing products and by aircraft operators. Access to these videos may be available through the regional deicing/anti-icing coordinator.

B. Forms. None.

C. Job Aids. Job Task Analyses (JTA) 2.3.34 and 3.3.57.
3-2242 PROCEDURES.

A. Brief the Operator.

1) Assist the operator in acquiring all of the pertinent published information.

2) Ensure that the operator is familiar with the technical difficulties that may be involved and the regulatory requirements that must be met.

3) Outline for the operator those elements that must be contained in the operator’s proposed program and the required actions at each stage of the approval process.

4) POIs and PMIs should inform the operators for which they have oversight responsibility of the process and criteria for approving infrared deicing systems. The operators should be informed that it is their responsibility to evaluate any infrared deicing system that they wish to use for their aircraft ground deicing/anti-icing program.

B. Review the Operator’s Submittal.

1) If the submission is incomplete, immediately inform the operator and determine if the operator intends to complete the package.

2) If the submission is complete, inform the operator and distribute the documents to the appropriate inspectors for initial examination.

3) If the package is unacceptable, discuss with the operator those elements that were unacceptable and/or return the package with a letter outlining the deficiencies.

4) Once an operator has determined that an infrared deicing system meets the criteria, that operator should present its findings of the evaluation to its principal inspector (PI).

C. Evaluate the Operator’s Deicing/Anti-Icing Program.

1) Ensure that the manual provides all categories of employees with instructions and information that helps them to perform their duties with a high degree of safety.

2) Ensure that the operator’s manual material includes the following:

   • Clear identification of each category of employee with responsibility for deicing/anti-icing program elements;
   • Duty definition of each category of employee involved;
   • Background information and step-by-step procedures; and
   • Checklists, where appropriate, that will allow each category of employee to perform their responsibilities to the required standard.

3) To ensure that the program complies with § 121.629(c), each operator’s ground deicing/anti-icing program must cover a management plan detailing operational responsibilities and procedures as described in AC 120-60.
D. Review Management Plan. The operator should develop, implement, and use a management plan to ensure proper execution of its approved deicing/anti-icing program. The management plan should include operations and maintenance responsibilities and identify the management positions that are responsible for ensuring that all necessary elements of the deicing/anti-icing program are properly executed.

E. Examine Holdover Timetables and the Procedures for Their Use. Ensure that each operator has developed, and has available, holdover timetables for use by its personnel. In addition, each operator must make its holdover timetables available for use in the cockpit. These timetables are required to be supported by data acceptable to the Administrator.

F. Evaluate the Operator’s Training. Ensure that the operator has developed a training program that qualifies each category of employee with responsibilities for deicing/anti-icing. Flightcrew training must be incorporated into the operator’s approved training program. The training program must include the following:

1) General procedures and any specific requirements for each make, model, and variant of aircraft used by the operator.

2) Means of testing, qualification, and requalification for each category of employee involved in the program.

3) Demonstration of proficiency, by performance, of flightcrew members, equipment operators, and inspectors.

4) Procedures for recurrent training.

G. Determine If Exceptions Apply to the Operator.

1) CHs That Do Not Operate in Ground Icing Conditions. The part 135 ground deicing rule does not apply to a CH that does not operate in ground icing conditions. This CH is not required to train its pilots or develop pretakeoff contamination check procedures. CHs that do not operate in ground icing conditions will have that limitation in their OpSpec A042.

2) Operators Using Only One Pilot in Operations. Single-pilot operators are not required to comply with the manual and approved training requirements of § 135.21 or § 135.341. Therefore, single-pilot operators are not required to have an approved pilot training program or the additional training required by the part 135 ground deicing rule. However, single-pilot operators must comply with all of the operational requirements of the part 135 ground deicing rule. Those operational requirements include a pretakeoff contamination check or an approved alternative procedure to the pretakeoff contamination check described in its OpSpec. The pilots of these types of operators will need to demonstrate sufficient knowledge to operate in ground icing conditions during the initial and recurrent flight checks. A single-pilot operator will have an aircraft specific description of the pretakeoff contamination check in its OpSpec A041.

3) Helicopter Operations. Helicopter operations conducted under part 135 are excluded from the additional training and pretakeoff contamination check requirements of the
part 135 ground deicing rule. However, the regulation requires the “clean aircraft” concept for helicopters.

H. Determine If Operator’s Program Meets Training Requirements of Part 135 Ground Deicing Rule. For operators required to have an approved training program, the training program must include pilot ground training in those subject areas relating to deicing and anti-icing operations required by § 135.345 for initial, transition, and upgrade training and by § 135.351 for recurrent training and testing. These training requirements must include procedures for operating airplanes during ground icing conditions. The operator must provide that training to its pilots and all other participating personnel. The training must include at least the following elements:

1) **Use of HOTs.** In part 135 operations, HOTs are only advisory and serve as guidance to the pilot in making takeoff decisions. If the operator uses the deicing/anti-icing fluids, it must train its pilots in the use of HOTs.

2) **Deicing/Anti-Icing Procedures.** Airplane deicing/anti-icing procedures include inspections and check procedures, and responsibilities and requirements for the pretakeoff contamination check or alternative procedures, as applicable.

3) **Communications.** The operator must provide training for all company personnel in communicating with all agencies involved in the deicing/anti-icing process and the decision-making process.

4) **Contamination.** Aircraft surface contamination training includes how to identify frost, ice, or snow, and how to locate critical areas. Training should include an explanation of how small amounts of surface contamination adversely affect aircraft performance and flight characteristics.

5) **Deicing/Anti-Icing Fluids.** If the operator uses deicing/anti-icing fluids, it must train its pilots, as well as any other participating personnel, in the types and characteristics of deicing/anti-icing fluids.

   **NOTE:** It is important that flightcrews do not use deicing/anti-icing fluids unless they have been trained in the characteristics and effects of these fluids on their operation.

6) **Cold Weather Preflight Inspection Procedures.** Training should include procedures for cold weather preflight inspections.

7) **Contamination Recognition.** This aspect of training should cover techniques for recognizing contamination on the aircraft. These techniques should be used during both the preflight inspection and the pretakeoff contamination check.

   **NOTE:** Parts 121 and 135 operators both must have documentation in their general manuals (GM) or flight manuals (FM) for the procedures they intend to use to comply with their respective deicing/anti-icing rule.
3-2243 TASK OUTCOMES.

A. Complete the SAS AR Record. For part 125.

B. Follow SAS Guidance Module 5. For parts 121 and 135.

C. Complete the Task. Completion of this task will result in one of the following:
   - For program approval, the result is issuance of OpSpecs.
   - For program disapproval, the result is listing of the restriction in OpSpec A004.

D. Document the Task. For part 125, file all of the supporting paperwork in the operator’s office file. For parts 121 and 135, follow the SAS process.

3-2244 FUTURE ACTIVITIES. Normal surveillance.

RESERVED. Paragraphs 3-2245 through 3-2248.