§ 23.1431  (b) Except as provided by paragraph (c) of this section, in addition to the analysis and physical evaluation prescribed in paragraph (a) of this section, the effectiveness of the ice protection system and its components must be shown by flight tests of the airplane or its components in measured natural atmospheric icing conditions and by one or more of the following tests, as found necessary to determine the adequacy of the ice protection system—

(1) Laboratory dry air or simulated icing tests, or a combination of both, of the components or models of the components.

(2) Flight dry air tests of the ice protection system as a whole, or its individual components.

(3) Flight test of the airplane or its components in measured simulated icing conditions.

(c) If certification with ice protection has been accomplished on prior type certificated airplanes whose designs include components that are thermodynamically and aerodynamically equivalent to those used on a new airplane design, certification of these equivalent components may be accomplished by reference to previously accomplished tests, required in §23.1419 (a) and (b), provided that the applicant accounts for any differences in installation of these components.

(d) A means must be identified or provided for determining the formation of ice on the critical parts of the airplane. Adequate lighting must be provided for the use of this means during night operation. Also, when monitoring of the external surfaces of the airplane by the flight crew is required for operation of the ice protection equipment, external lighting must be provided that is adequate to enable the monitoring to be done at night. Any illumination that is used must be of a type that will not cause glare or reflection that would handicap crewmembers in the performance of their duties. The Airplane Flight Manual or other approved manual material must describe the means of determining ice formation and must contain information for the safe operation of the airplane in icing conditions.

§ 23.1435  Hydraulic systems.

(a) Design. Each hydraulic system must be designed as follows:
Federal Aviation Administration, DOT

§ 23.1441 Oxygen equipment and supply.

(a) If certification with supplemental oxygen equipment is requested, or the airplane is approved for operations at or above altitudes where oxygen is required to be used by the operating rules, oxygen equipment must be provided that meets the requirements of this section and §§23.1443 through 23.1449. Portable oxygen equipment may be used to meet the requirements of this part if the portable equipment is shown to comply with the applicable requirements, is identified in the airplane type design, and its stowage provisions are found to be in compliance with the requirements of §23.561.

(b) The oxygen system must be free from hazards in itself, in its method of operation, and its effect upon other components.

(c) There must be a means to allow the crew to readily determine, during the flight, the quantity of oxygen available in each source of supply.

(d) Each required flight crewmember must be provided with—

(1) Demand oxygen equipment if the airplane is to be certificated for operation above 25,000 feet.

(2) Pressure demand oxygen equipment if the airplane is to be certificated for operation above 40,000 feet.

(e) There must be a means, readily available to the crew in flight, to turn on and to shut off the oxygen supply at the high pressure source. This shutoff requirement does not apply to chemical oxygen generators.

[Amendment 23–9, 35 FR 6386, Apr. 21, 1970, as amended by Amendment 23–43, 58 FR 18978, Apr. 9, 1993]