

system, another power source (including its separate feeder) must be provided automatically or be manually selectable to maintain equipment or system operation.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c), Dept. of Transportation Act (49 U.S.C. 1655(c)))

[Doc. No. 5084, 29 FR 16150, Dec. 3, 1964, as amended by Amdt. 29-14, 42 FR 36973, July 18, 1977; Amdt. 29-24, 49 FR 44439, Nov. 6, 1984]

#### § 29.1357 Circuit protective devices.

(a) Automatic protective devices must be used to minimize distress to the electrical system and hazard to the rotorcraft system and hazard to the rotorcraft in the event of wiring faults or serious malfunction of the system or connected equipment.

(b) The protective and control devices in the generating system must be designed to de-energize and disconnect faulty power sources and power transmission equipment from their associated buses with sufficient rapidity to provide protection from hazardous overvoltage and other malfunctioning.

(c) Each resettable circuit protective device must be designed so that, when an overload or circuit fault exists, it will open the circuit regardless of the position of the operating control.

(d) If the ability to reset a circuit breaker or replace a fuse is essential to safety in flight, that circuit breaker or fuse must be located and identified so that it can be readily reset or replaced in flight.

(e) Each essential load must have individual circuit protection. However, individual protection for each circuit in an essential load system (such as each position light circuit in a system) is not required.

(f) If fuses are used, there must be spare fuses for use in flight equal to at least 50 percent of the number of fuses of each rating required for complete circuit protection.

(g) Automatic reset circuit breakers may be used as integral protectors for electrical equipment provided there is circuit protection for the cable supplying power to the equipment.

[Doc. No. 5084, 29 FR 16150, Dec. 3, 1964, as amended by Amdt. 29-24, 49 FR 44440, Nov. 6, 1984]

#### § 29.1359 Electrical system fire and smoke protection.

(a) Components of the electrical system must meet the applicable fire and smoke protection provisions of §§ 29.831 and 29.863.

(b) Electrical cables, terminals, and equipment, in designated fire zones, and that are used in emergency procedures, must be at least fire resistant.

(c) Insulation on electrical wire and cable installed in the rotorcraft must be self-extinguishing when tested in accordance with Appendix F, Part I(a)(3), of part 25 of this chapter.

[Doc. No. 5084, 29 FR 16150, Dec. 3, 1964, as amended by Amdt. 29-42, 63 FR 43285, Aug. 12, 1998]

#### § 29.1363 Electrical system tests.

(a) When laboratory tests of the electrical system are conducted—

(1) The tests must be performed on a mock-up using the same generating equipment used in the rotorcraft;

(2) The equipment must simulate the electrical characteristics of the distribution wiring and connected loads to the extent necessary for valid test results; and

(3) Laboratory generator drives must simulate the prime movers on the rotorcraft with respect to their reaction to generator loading, including loading due to faults.

(b) For each flight condition that cannot be simulated adequately in the laboratory or by ground tests on the rotorcraft, flight tests must be made.

### LIGHTS

#### § 29.1381 Instrument lights.

The instrument lights must—

(a) Make each instrument, switch, and other device for which they are provided easily readable; and

(b) Be installed so that—

(1) Their direct rays are shielded from the pilot's eyes; and

(2) No objectionable reflections are visible to the pilot.

#### § 29.1383 Landing lights.

(a) Each required landing or hovering light must be approved.

(b) Each landing light must be installed so that—