

**§ 25.1705**

**14 CFR Ch. I (1–1–14 Edition)**

must be protected to minimize any hazardous effects due to moisture.

**§ 25.1705 Systems and functions: EWIS.**

(a) EWIS associated with any system required for type certification or by operating rules must be considered an integral part of that system and must be considered in showing compliance with the applicable requirements for that system.

(b) For systems to which the following rules apply, the components of EWIS associated with those systems must be considered an integral part of that system or systems and must be considered in showing compliance with the applicable requirements for that system.

(1) § 25.773(b)(2) Pilot compartment view.

(2) § 25.981 Fuel tank ignition prevention.

(3) § 25.1165 Engine ignition systems.

(4) § 25.1310 Power source capacity and distribution.

(5) § 25.1316 System lightning protection.

(6) § 25.1331(a)(2) Instruments using a power supply.

(7) § 25.1351 General.

(8) § 25.1355 Distribution system.

(9) § 25.1360 Precautions against injury.

(10) § 25.1362 Electrical supplies for emergency conditions.

(11) § 25.1365 Electrical appliances, motors, and transformers.

(12) § 25.1431(c) and (d) Electronic equipment.

**§ 25.1707 System separation: EWIS.**

(a) Each EWIS must be designed and installed with adequate physical separation from other EWIS and airplane systems so that an EWIS component failure will not create a hazardous condition. Unless otherwise stated, for the purposes of this section, adequate physical separation must be achieved by separation distance or by a barrier that provides protection equivalent to that separation distance.

(b) Each EWIS must be designed and installed so that any electrical interference likely to be present in the airplane will not result in hazardous effects upon the airplane or its systems.

(c) Wires and cables carrying heavy current, and their associated EWIS components, must be designed and installed to ensure adequate physical separation and electrical isolation so that damage to circuits associated with essential functions will be minimized under fault conditions.

(d) Each EWIS associated with independent airplane power sources or power sources connected in combination must be designed and installed to ensure adequate physical separation and electrical isolation so that a fault in any one airplane power source EWIS will not adversely affect any other independent power sources. In addition:

(1) Airplane independent electrical power sources must not share a common ground terminating location.

(2) Airplane system static grounds must not share a common ground terminating location with any of the airplane's independent electrical power sources.

(e) Except to the extent necessary to provide electrical connection to the fuel systems components, the EWIS must be designed and installed with adequate physical separation from fuel lines and other fuel system components, so that:

(1) An EWIS component failure will not create a hazardous condition.

(2) Any fuel leakage onto EWIS components will not create a hazardous condition.

(f) Except to the extent necessary to provide electrical connection to the hydraulic systems components, EWIS must be designed and installed with adequate physical separation from hydraulic lines and other hydraulic system components, so that:

(1) An EWIS component failure will not create a hazardous condition.

(2) Any hydraulic fluid leakage onto EWIS components will not create a hazardous condition.

(g) Except to the extent necessary to provide electrical connection to the oxygen systems components, EWIS must be designed and installed with adequate physical separation from oxygen lines and other oxygen system components, so that an EWIS component failure will not create a hazardous condition.

(h) Except to the extent necessary to provide electrical connection to the water/waste systems components, EWIS must be designed and installed with adequate physical separation from water/waste lines and other water/waste system components, so that:

(1) An EWIS component failure will not create a hazardous condition.

(2) Any water/waste leakage onto EWIS components will not create a hazardous condition.

(i) EWIS must be designed and installed with adequate physical separation between the EWIS and flight or other mechanical control systems cables and associated system components, so that:

(1) Chafing, jamming, or other interference are prevented.

(2) An EWIS component failure will not create a hazardous condition.

(3) Failure of any flight or other mechanical control systems cables or systems components will not damage the EWIS and create a hazardous condition.

(j) EWIS must be designed and installed with adequate physical separation between the EWIS components and heated equipment, hot air ducts, and lines, so that:

(1) An EWIS component failure will not create a hazardous condition.

(2) Any hot air leakage or heat generated onto EWIS components will not create a hazardous condition.

(k) For systems for which redundancy is required, by certification rules, by operating rules, or as a result of the assessment required by § 25.1709, EWIS components associated with those systems must be designed and installed with adequate physical separation.

(1) Each EWIS must be designed and installed so there is adequate physical separation between it and other aircraft components and aircraft structure, and so that the EWIS is protected from sharp edges and corners, to minimize potential for abrasion/chafing, vibration damage, and other types of mechanical damage.

**§ 25.1709 System safety: EWIS.**

Each EWIS must be designed and installed so that:

(a) Each catastrophic failure condition—

(1) Is extremely improbable; and

(2) Does not result from a single failure.

(b) Each hazardous failure condition is extremely remote.

**§ 25.1711 Component identification: EWIS.**

(a) EWIS components must be labeled or otherwise identified using a consistent method that facilitates identification of the EWIS component, its function, and its design limitations, if any.

(b) For systems for which redundancy is required, by certification rules, by operating rules, or as a result of the assessment required by § 25.1709, EWIS components associated with those systems must be specifically identified with component part number, function, and separation requirement for bundles.

(1) The identification must be placed along the wire, cable, or wire bundle at appropriate intervals and in areas of the airplane where it is readily visible to maintenance, repair, or alteration personnel.

(2) If an EWIS component cannot be marked physically, then other means of identification must be provided.

(c) The identifying markings required by paragraphs (a) and (b) of this section must remain legible throughout the expected service life of the EWIS component.

(d) The means used for identifying each EWIS component as required by this section must not have an adverse effect on the performance of that component throughout its expected service life.

(e) Identification for EWIS modifications to the type design must be consistent with the identification scheme of the original type design.

**§ 25.1713 Fire protection: EWIS.**

(a) All EWIS components must meet the applicable fire and smoke protection requirements of § 25.831(c) of this part.

(b) EWIS components that are located in designated fire zones and are used during emergency procedures must be fire resistant.