§ 29.861 Fire protection of structure, controls, and other parts.

Each part of the structure, controls, and the rotor mechanism, and other parts essential to controlled landing and (for category A) flight that would be affected by powerplant fires must be isolated under §29.1191, or must be—

(a) For category A rotorcraft, fireproof; and

(b) For Category B rotorcraft, fireproof or protected so that they can perform their essential functions for at least 5 minutes under any foreseeable powerplant fire conditions.


§ 29.863 Flammable fluid fire protection.

(a) In each area where flammable fluids or vapors might escape by leakage of a fluid system, there must be means to minimize the probability of ignition of the fluids and vapors, and the resultant hazards if ignition does occur.

(b) Compliance with paragraph (a) of this section must be shown by analysis or tests, and the following factors must be considered:

(1) Possible sources and paths of fluid leakage, and means of detecting leakage.

(2) Flammability characteristics of fluids, including effects of any combustible or absorbing materials.

(3) Possible ignition sources, including electrical faults, overheating of equipment, and malfunctioning of protective devices.

(4) Means available for controlling or extinguishing a fire, such as stopping flow of fluids, shutting down equipment, fireproof containment, or use of extinguishing agents.

(5) Ability of rotorcraft components that are critical to safety of flight to withstand fire and heat.

(c) If action by the flight crew is required to prevent or counteract a fluid fire (e.g. equipment shutdown or actuation of a fire extinguisher), quick acting means must be provided to alert the crew.

(d) Each area where flammable fluids or vapors might escape by leakage of a fluid system must be identified and defined.

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

[Amdt. 29–17, 43 FR 50600, Oct. 30, 1978]
Federal Aviation Administration, DOT § 29.865

load for which authorization is requested. It must be shown by analysis, test, or both that the rotorcraft external load attaching means and corresponding personnel carrying device system for rotorcraft-load combinations to be used for human external cargo applications can withstand a limit static load equal to 3.5 or some lower load factor, not less than 2.5, approved under §§ 29.337 through 29.341, multiplied by the maximum external load for which authorization is requested. The load for any rotorcraft-load combination class, for any external cargo type, must be applied in the vertical direction. For jettisonable external loads of any applicable external cargo type, the load must also be applied in any direction making the maximum angle with the vertical that can be achieved in service but not less than 30°. However, the 30° angle may be reduced to a lesser angle if—

(1) An operating limitation is established limiting external load operations to such angles for which compliance with this paragraph has been shown; or

(2) It is shown that the lesser angle can not be exceeded in service.

(b) The external load attaching means, for jettisonable rotorcraft-load combinations, must include a quick-release system to enable the pilot to release the external load quickly during flight. The quick-release system must consist of a primary quick release subsystem and a backup quick release subsystem that are isolated from one another. The quick release system, and the means by which it is controlled, must comply with the following:

(1) A control for the primary quick release subsystem must be installed either on one of the pilot’s primary controls or in an equivalently accessible location and must be designed and located so that it may be operated by either the pilot or a crewmember without hazardously limiting the ability to control the rotorcraft during an emergency situation.

(2) A control for the backup quick release subsystem, readily accessible to either the pilot or another crewmember, must be provided.

(c) For rotorcraft-load combinations to be used for human external cargo applications, the rotorcraft must—

(1) For jettisonable external loads, have a quick-release system that meets the requirements of paragraph (b) of this section and that—

(i) Provides a dual actuation device for the primary quick release subsystem, and

(ii) Provides a separate dual actuation device for the backup quick release subsystem;

(2) Have a reliable, approved personnel carrying device system that has the structural capability and personnel safety features essential for external occupant safety;

(3) Have placards and markings at all appropriate locations that clearly state the essential system operating instructions and, for the personnel carrying device system, ingress and egress instructions;

(4) Have equipment to allow direct intercommunication among required crewmembers and external occupants;

(5) Have the appropriate limitations and procedures incorporated in the flight manual for conducting human external cargo operations; and

(6) For human external cargo applications requiring use of Category A rotorcraft, have one-engine-inoperative hover performance data and procedures...
in the flight manual for the weights, altitudes, and temperatures for which external load approval is requested.

(d) The critically configured jettisonable external loads must be shown by a combination of analysis, ground tests, and flight tests to be both transportable and releasable throughout the approved operational envelope without hazard to the rotorcraft during normal flight conditions. In addition, these external loads—must be shown to be releasable without hazard to the rotorcraft during emergency flight conditions.

(e) A placard or marking must be installed next to the external-load attaching means clearly stating any operational limitations and the maximum authorized external load as demonstrated under §29.25 and this section.

(f) The fatigue evaluation of §29.571 of this part does not apply to rotorcraft-load combinations to be used for nonhuman external cargo except for the failure of critical structural elements that would result in a hazard to the rotorcraft. For rotorcraft-load combinations to be used for human external cargo, the fatigue evaluation of §29.571 of this part applies to the entire quick release and personnel carrying device structural systems and their attachments.

[Amendment 29–12, 41 FR 55472, Dec. 20, 1976, as amended by Amendment 27–26, 55 FR 8005, Mar. 6, 1990; Amendment 29–43, 64 FR 43020, Aug. 6, 1999]

MISCELLANEOUS

§ 29.871 Leveling marks.
There must be reference marks for leveling the rotorcraft on the ground.

§ 29.873 Ballast provisions.
Ballast provisions must be designed and constructed to prevent inadvertent shifting of ballast in flight.

Subpart E—Powerplant

GENERAL

§ 29.901 Installation.
(a) For the purpose of this part, the powerplant installation includes each part of the rotorcraft (other than the main and auxiliary rotor structures) that—

1. Is necessary for propulsion;
2. Affects the control of the major propulsive units; or
3. Affects the safety of the major propulsive units between normal inspections or overhauls.

(b) For each powerplant installation—

1. The installation must comply with—
   (i) The installation instructions provided under §33.5 of this chapter; and
   (ii) The applicable provisions of this subpart.
2. Each component of the installation must be constructed, arranged, and installed to ensure its continued safe operation between normal inspections or overhauls for the range of temperature and altitude for which approval is requested.
3. Accessibility must be provided to allow any inspection and maintenance necessary for continued airworthiness; and
4. Electrical interconnections must be provided to prevent differences of potential between major components of the installation and the rest of the rotorcraft.
5. Axial and radial expansion of turbine engines may not affect the safety of the installation.
6. Design precautions must be taken to minimize the possibility of incorrect assembly of components and equipment essential to safe operation of the rotorcraft, except where operation with the incorrect assembly can be shown to be extremely improbable.
7. For each powerplant and auxiliary power unit installation, it must be established that no single failure or malfunction or probable combination of failures will jeopardize the safe operation of the rotorcraft except that the failure of structural elements need not be considered if the probability of any such failure is extremely remote.