margins between the calculated critical speeds and the limits of the allowable operating ranges must be adequate to allow for possible variations between the computed and actual values.

§ 27.935 Shafting joints.
Each universal joint, slip joint, and other shafting joints whose lubrication is necessary for operation must have provision for lubrication.

§ 27.939 Turbine engine operating characteristics.
(a) Turbine engine operating characteristics must be investigated in flight to determine that no adverse characteristics (such as stall, surge, or flameout) are present, to a hazardous degree, during normal and emergency operation within the range of operating limitations of the rotorcraft and of the engine.
(b) The turbine engine air inlet system may not, as a result of airflow distortion during normal operation, cause vibration harmful to the engine.
(c) For governor-controlled engines, it must be shown that there exists no hazardous torsional instability of the drive system associated with critical combinations of power, rotational speed, and control displacement.

[Federal Aviation Administration, DOT § 27.952

§ 27.952 Fuel system crash resistance.
Unless other means acceptable to the Administrator are employed to minimize the hazard of fuel fires to occupants following an otherwise survivable impact (crash landing), the fuel systems must incorporate the design features of this section. These systems must be shown to be capable of sustaining the static and dynamic deceleration loads of this section, considered as ultimate loads acting alone, measured at the system component's center of gravity, without structural damage to system components, fuel tanks, or their attachments that would leak fuel to an ignition source.

(a) Drop test requirements. Each tank, or the most critical tank, must be drop-tested as follows:
(1) The drop height must be at least 50 feet.
(2) The drop impact surface must be nondeforming.
(3) The tank must be filled with water to 80 percent of the normal, full capacity.
(4) The tank must be encased in a surrounding structure representative of the installation unless it can be established that the surrounding structure is free of projections or other design features likely to contribute to rupture of the tank.
(5) The tank must drop freely and impact in a horizontal position ±10°.
(6) After the drop test, there must be no leakage.

(b) Fuel tank load factors. Except for fuel tanks located so that tank rupture with fuel release to either significant ignition sources, such as engines, heaters, and auxiliary power units, or occupants is extremely remote, each fuel tank must be designed and installed to retain its contents under the following ultimate inertial load factors, acting alone.
(1) For fuel tanks in the cabin:
   (i) Upward—4g.
   (ii) Forward—16g.
   (iii) Sideward—8g.
   (iv) Downward—20g.

[Doc. No. 5074, 29 FR 15695, Nov. 24, 1964, as amended by Amdt. 27–9, 39 FR 35461, Oct. 1, 1974]