§ 27.619 Special factors.

(a) The special factors prescribed in §§ 27.621 through 27.625 apply to each part of the structure whose strength is—

(1) Uncertain;

(2) Likely to deteriorate in service before normal replacement; or

(3) Subject to appreciable variability due to—

(i) Uncertainties in manufacturing processes; or

(ii) Uncertainties in inspection methods.

(b) For each part to which §§ 27.621 through 27.625 apply, the factor of safety prescribed in § 27.303 must be multiplied by a special factor equal to—

(1) The applicable special factors prescribed in §§ 27.621 through 27.625; or

(2) Any other factor great enough to ensure that the probability of the part being understrength because of the uncertainties specified in paragraph (a) of this section is extremely remote.

§ 27.621 Casting factors.

(a) General. The factors, tests, and inspections specified in paragraphs (b) and (c) of this section must be applied in addition to those necessary to establish foundry quality control. The inspections must meet approved specifications. Paragraphs (c) and (d) of this section apply to structural castings except castings that are pressure tested as parts of hydraulic or other fluid systems and do not support structural loads.

(b) Bearing stresses and surfaces. The casting factors specified in paragraphs (c) and (d) of this section—

(1) Need not exceed 1.25 with respect to bearing stresses regardless of the method of inspection used; and

(2) Need not be used with respect to the bearing surfaces of a part whose bearing factor is larger than the applicable casting factor.

(c) Critical castings. For each casting whose failure would preclude continued safe flight and landing of the rotorcraft or result in serious injury to any occupant, the following apply:

(1) Each critical casting must—

(i) Have a casting factor of not less than 1.25; and

(ii) Receive 100 percent inspection by visual, radiographic, and magnetic particle (for ferromagnetic materials) or penetrant (for nonferromagnetic materials) inspection methods or approved equivalent inspection methods.

(2) For each critical casting with a casting factor less than 1.50, three sample castings must be static tested and shown to meet—

(i) The strength requirements of § 27.305 at an ultimate load corresponding to a casting factor of 1.25; and

(ii) The deformation requirements of § 27.305 at a load of 1.15 times the limit load.