AUTHORITY: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

SOURCE: Docket No. 3025, 29 FR 7453, June 10, 1964, unless otherwise noted.

NOTE: For miscellaneous amendments to cross references in this Part 33, see Amdt. 33–2, 31 FR 9211, July 6, 1966.

Subpart A—General

§ 33.1 Applicability.

(a) This part prescribes airworthiness standards for the issue of type certificates and changes to those certificates, for aircraft engines.

(b) Each person who applies under part 21 for such a certificate or change must show compliance with the applicable requirements of this part and the applicable requirements of part 34 of this chapter.

[Amdt. 33–7, 41 FR 55474, Dec. 20, 1976, as amended by Amdt. 33–14, 55 FR 32861, Aug. 10, 1990]

§ 33.3 General.

Each applicant must show that the aircraft engine concerned meets the applicable requirements of this part.

§ 33.4 Instructions for Continued Airworthiness.

The applicant must prepare Instructions for Continued Airworthiness in accordance with appendix A to this part that are acceptable to the Administrator. The instructions may be incomplete at type certification if a program exists to ensure their completion prior to delivery of the first aircraft with the engine installed, or upon issuance of a standard certificate of airworthiness for the aircraft with the engine installed, whichever occurs later.

[Amdt. 33–9, 45 FR 60181, Sept. 11, 1980]

§ 33.5 Instruction manual for installing and operating the engine.

Each applicant must prepare and make available to the Administrator prior to the issuance of the type certificate, and to the owner at the time of delivery of the engine, approved instructions for installing and operating the engine. The instructions must include at least the following:

(a) *Installation instructions.* (1) The location of engine mounting attachments, the method of attaching the engine to the aircraft, and the maximum allowable load for the mounting attachments and related structure.

(2) The location and description of engine connections to be attached to accessories, pipes, wires, cables, ducts, and cowling.

(3) An outline drawing of the engine including overall dimensions.

(4) A definition of the physical and functional interfaces with the aircraft and aircraft equipment, including the propeller when applicable.

(5) Where an engine system relies on components that are not part of the engine type design, the interface conditions and reliability requirements for those components upon which engine type certification is based must be specified in the engine installation instructions directly or by reference to appropriate documentation.

(6) A list of the instruments necessary for control of the engine, including the overall limits of accuracy and transient response required of such instruments for control of the operation of the engine, must also be stated so that the suitability of the instruments as installed may be assessed.

(b) *Operation instructions.* (1) The operating limitations established by the Administrator.

(2) The power or thrust ratings and procedures for correcting for nonstandard atmosphere.

(3) The recommended procedures, under normal and extreme ambient conditions for—

(i) Starting;

(ii) Operating on the ground; and

(iii) Operating during flight.

(4) For rotorcraft engines having one or more OEI ratings, applicants must provide data on engine performance characteristics and variability to enable the aircraft manufacturer to establish aircraft power assurance procedures.

(5) A description of the primary and all alternate modes, and any back-up system, together with any associated limitations, of the engine control system and its interface with the aircraft systems, including the propeller when applicable.

(c) *Safety analysis assumptions.* The assumptions of the safety analysis as described in § 33.75(d) with respect to the reliability of safety devices, instrumentation, early warning devices, maintenance checks, and similar equipment or procedures that are outside the control of the engine manufacturer.

[Amdt. 33–6, 39 FR 35463, Oct. 1, 1974, as amended by Amdt. 33–9, 45 FR 60181, Sept. 11, 1980; Amdt. 33–24, 47 FR 50867, Sept. 4, 2007; Amdt. 33–25, 73 FR 48123, Aug. 18, 2008; Amdt. 33–26, 73 FR 48284, Aug. 19, 2008]

§ 33.7 Engine ratings and operating limitations.

(a) Engine ratings and operating limitations are established by the Administrator and included in the engine certificate data sheet specified in § 21.41 of this chapter, including ratings and limitations based on the operating conditions and information specified in this section, as applicable, and any other information found necessary for safe operation of the engine.

(b) For reciprocating engines, ratings and operating limitations are established relating to the following:

(1) Horsepower or torque, r.p.m., manifold pressure, and time at critical pressure altitude and sea level pressure altitude for—

(i) Rated maximum continuous power (relating to unsupercharged operation or to operation in each supercharger mode as applicable); and

(ii) Rated takeoff power (relating to unsupercharged operation or to operation in each supercharger mode as applicable).

(2) Fuel grade or specification.

(3) Oil grade or specification.

(4) Temperature of the—

(i) Cylinder;

(ii) Oil at the oil inlet; and

(iii) Turbosupercharger turbine wheel inlet gas.

(5) Pressure of—

(i) Fuel at the fuel inlet; and

(ii) Oil at the main oil gallery.

(6) Accessory drive torque and overhang moment.

(7) Component life.

(8) Turbosupercharger turbine wheel r.p.m.