

(c) The equipment, systems, and installations must be designed to prevent hazards to the balloon in the event of a probable malfunction or failure.

[Amdt. 31-4, 45 FR 60180, Sept. 11, 1980]

### Subpart F—Operating Limitations and Information

#### §31.81 General.

(a) The following information must be established:

(1) Each operating limitation, including the maximum weight determined under §31.14.

(2) The normal and emergency procedures.

(3) Other information necessary for safe operation, including—

(i) The empty weight determined under §31.16;

(ii) The rate of climb determined under §31.17, and the procedures and conditions used to determine performance;

(iii) The maximum vertical velocity, the altitude drop required to attain that velocity, and altitude drop required to recover from a descent at that velocity, determined under §31.19, and the procedures and conditions used to determine performance; and

(iv) Pertinent information peculiar to the balloon's operating characteristics.

(b) The information established in compliance with paragraph (a) of this section must be furnished by means of—

(1) A Balloon Flight Manual; or

(2) A placard on the balloon that is clearly visible to the pilot.

[Amdt. 31-4, 45 FR 60180, Sept. 11, 1980]

#### §31.82 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 balloon or issuance of a standard certificate of airworthiness, whichever occurs later.

[Amdt. 31-4, 45 FR 60180, Sept. 11, 1980]

#### §31.83 Conspicuity.

The exterior surface of the envelope must be of a contrasting color or colors so that it will be conspicuous during operation. However, multicolored banners or streamers are acceptable if it can be shown that they are large enough, and there are enough of them of contrasting color, to make the balloon conspicuous during flight.

#### §31.85 Required basic equipment.

In addition to any equipment required by this subchapter for a specific kind of operation, the following equipment is required:

(a) For all balloons:

(1) [Reserved]

(2) An altimeter.

(3) A rate of climb indicator.

(b) For hot air balloons:

(1) A fuel quantity gauge. If fuel cells are used, means must be incorporated to indicate to the crew the quantity of fuel in each cell during flight. The means must be calibrated in appropriate units or in percent of fuel cell capacity.

(2) An envelope temperature indicator.

(c) For captive gas balloons, a compass.

[Amdt. 31-2, 30 FR 3377, Mar. 13, 1965, as amended by Amdt. 31-3, 41 FR 55474, Dec. 20, 1976; Amdt. 31-4, 45 FR 60180, Sept. 11, 1980]

#### APPENDIX A TO PART 31—INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

##### A31.1 GENERAL

(a) This appendix specifies requirements for the preparation of Instructions for Continued Airworthiness as required by §31.82.

(b) The Instructions for Continued Airworthiness for each balloon must include the Instructions for Continued Airworthiness for all balloon parts required by this chapter and any required information relating to the interface of those parts with the balloon. If Instructions for Continued Airworthiness are not supplied by the part manufacturer for a balloon part, the Instructions for Continued Airworthiness for the balloon must include the information essential to the continued airworthiness of the balloon.

(c) The applicant must submit to the FAA a program to show how changes to the Instructions for Continued Airworthiness made by the applicant or by the manufacturers of balloon parts will be distributed.

## A31.2 FORMAT

(a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.

(b) The format of the manual or manuals must provide for a practical arrangement.

## A31.3 CONTENT

The contents of the manual or manuals must be prepared in the English language. The Instructions for Continued Airworthiness must contain the following information:

(a) Introduction information that includes an explanation of the balloon's features and data to the extent necessary for maintenance or preventive maintenance.

(b) A description of the balloon and its systems and installations.

(c) Basic control and operation information for the balloon and its components and systems.

(d) Servicing information that covers details regarding servicing of balloon components, including burner nozzles, fuel tanks, and valves during operations.

(e) Maintenance information for each part of the balloon and its envelope, controls, rigging, basket structure, fuel systems, instruments, and heater assembly that provides the recommended periods at which they should be cleaned, adjusted, tested, and lubricated, the applicable wear tolerances, and the degree of work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the balloon.

(f) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.

(g) Details of what, and how, to inspect after a hard landing.

(h) Instructions for storage preparation including any storage limits.

(i) Instructions for repair on the balloon envelope and its basket or trapeze.

## A31.4 AIRWORTHINESS LIMITATIONS SECTION

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each

mandatory replacement time, structural inspection interval, and related structural inspection procedure, including envelope structural integrity, required for type certification. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations."

[Amdt. 31-4, 45 FR 60180, Sept. 11, 1980, as amended by Amdt. 31-5, 54 FR 34330, Aug. 18, 1989]

## PART 33—AIRWORTHINESS STANDARDS: AIRCRAFT ENGINES

### Subpart A—General

Sec.

33.1 Applicability.

33.3 General.

33.4 Instructions for Continued Airworthiness.

33.5 Instruction manual for installing and operating the engine.

33.7 Engine ratings and operating limitations.

33.8 Selection of engine power and thrust ratings.

### Subpart B—Design and Construction; General

33.11 Applicability.

33.13 [Reserved]

33.14 Start-stop cyclic stress (low-cycle fatigue).

33.15 Materials.

33.17 Fire prevention.

33.19 Durability.

33.21 Engine cooling.

33.23 Engine mounting attachments and structure.

33.25 Accessory attachments.

33.27 Turbine, compressor, fan, and turbo-supercharger rotors.

33.28 Electrical and electronic engine control systems.

33.29 Instrument connection.

### Subpart C—Design and Construction; Reciprocating Aircraft Engines

33.31 Applicability.

33.33 Vibration.

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33.37 Ignition system.

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