§ 23.1453 Protection of oxygen equipment from rupture.

(a) Each element of the oxygen system must have sufficient strength to withstand the maximum pressure and temperature, in combination with any externally applied loads arising from consideration of limit structural loads, that may be acting on that part of the system.

(b) Oxygen pressure sources and the lines between the source and the shut-off means must be:

1. Protected from unsafe temperatures; and
2. Located where the probability and hazard of rupture in a crash landing are minimized.

§ 23.1457 Cockpit voice recorders.

(a) Each cockpit voice recorder required by the operating rules of this chapter must be approved and must be installed so that it will record the following:

1. Voice communications transmitted from or received in the airplane by radio.
2. Voice communications of flight crewmembers on the flight deck.

(b) The recording requirements of paragraph (a)(2) of this section must be met by installing a cockpit-mounted area microphone, located in the best position for recording voice communications originating at the first and second pilot stations and voice communications of other crewmembers on the flight deck when directed to those stations. The microphone must be so located and, if necessary, the pre-amplifiers and filters of the recorder must be so adjusted or supplemented, so that the intelligibility of the recorded communications is as high as practicable when recorded under flight cockpit noise conditions and played back. Repeated aural or visual playback of the record may be used in evaluating intelligibility.

(c) Each cockpit voice recorder must be installed so that the part of the communication or audio signals specified in paragraph (a) of this section obtained from each of the following sources is recorded on a separate channel:

1. For the first channel, from each boom, mask, or handheld microphone, headset, or speaker used at the first pilot station.
2. For the second channel from each boom, mask, or handheld microphone, headset, or speaker used at the second pilot station.
3. For the third channel—from the cockpit-mounted area microphone.
4. For the fourth channel from:
   (i) Each boom, mask, or handheld microphone, headset, or speaker used at the station for the third and fourth crewmembers.
   (ii) If the stations specified in paragraph (c)(4)(i) of this section are not required or if the signal at such a station is picked up by another channel, each microphone on the flight deck that is used with the passenger loudspeaker system, if its signals are not picked up by another channel.

(d) Each cockpit voice recorder must be installed so that:

1. It receives its electrical power from the bus that provides the maximum reliability for operation of the
§ 23.1459 Flight data recorders.

(a) Each flight recorder required by the operating rules of this chapter must be installed so that:

(1) It is supplied with airspeed, altitude, and directional data obtained from sources that meet the accuracy requirements of §§ 23.1323, 23.1325, and 23.1327, as appropriate;

(2) The vertical acceleration sensor is rigidly attached, and located longitudinally either within the approved center of gravity limits of the airplane, or at a distance forward or aft of these limits that does not exceed 25 percent of the airplane’s mean aerodynamic chord;

(3)(i) It receives its electrical power from the bus that provides the maximum reliability for operation of the flight data recorder without jeopardizing service to essential or emergency loads.

(ii) It remains powered for as long as possible without jeopardizing emergency operation of the airplane.

(4) There is an aural or visual means for preflight checking of the recorder for proper recording of data in the storage medium;

(b) Each flight recorder, in addition to those described in paragraph (a) of this section, must be installed so that:

(1) It is located as far aft as practicable, but need not be outside of the pressurized compartment, and may not be located where aft-mounted engines may crush the container during impact.

(2) It is in a separate container from the flight data recorder when both are required. If used to comply with the cockpit voice recorder requirements, a combination unit may be installed.

(c) If the flight data recorder has a bulk erasure device, the installation must be designed to minimize the probability of inadvertent operation and actuation of the device during crash impact.

(g) Each recorder container must:

(1) Be either bright orange or bright yellow;

(2) Have reflective tape affixed to its external surface to facilitate its location under water; and

(3) Have an underwater locating device, when required by the operating rules of this chapter, on or adjacent to the container which is secured in such manner that they are not likely to be separated during crash impact.

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