

(a) In addition to the requirements of §25.1141, no single failure or malfunction, or probable combination thereof, of the ATTCS, including associated systems, may cause the failure of any powerplant function necessary for safety.

(b) The ATTCS must be designed to:

(1) Apply thrust or power on the operating engine(s), following any one engine failure during takeoff, to achieve the maximum approved takeoff thrust or power without exceeding engine operating limits;

(2) Permit manual decrease or increase in thrust or power up to the maximum takeoff thrust or power approved for the airplane under existing conditions through the use of the power lever. For airplanes equipped with limiters that automatically prevent engine operating limits from being exceeded under existing ambient conditions, other means may be used to increase the thrust or power in the event of an ATTCS failure provided the means is located on or forward of the power levers; is easily identified and operated under all operating conditions by a single action of either pilot with the hand that is normally used to actuate the power levers; and meets the requirements of §25.777 (a), (b), and (c);

(3) Provide a means to verify to the flightcrew before takeoff that the ATTCS is in a condition to operate; and

(4) Provide a means for the flightcrew to deactivate the automatic function. This means must be designed to prevent inadvertent deactivation.

#### I25.6 *Powerplant Instruments.*

In addition to the requirements of §25.1305:

(a) A means must be provided to indicate when the ATTCS is in the armed or ready condition; and

(b) If the inherent flight characteristics of the airplane do not provide adequate warning that an engine has failed, a warning system that is independent of the ATTCS must be provided to give the pilot a clear warning of any engine failure during takeoff.

[Amdt. 25–62, 52 FR 43156, Nov. 9, 1987]

#### APPENDIX J TO PART 25—EMERGENCY EVACUATION

The following test criteria and procedures must be used for showing compliance with §25.803:

(a) The emergency evacuation must be conducted with exterior ambient light levels of no greater than 0.3 foot-candles prior to the activation of the airplane emergency lighting system. The source(s) of the initial exterior ambient light level may remain active or illuminated during the actual demonstration. There must, however, be no increase in the exterior ambient light level except for that due to activation of the airplane emergency lighting system.

(b) The airplane must be in a normal attitude with landing gear extended.

(c) Unless the airplane is equipped with an off-wing descent means, stands or ramps may be used for descent from the wing to the ground. Safety equipment such as mats or inverted life rafts may be placed on the floor or ground to protect participants. No other equipment that is not part of the emergency evacuation equipment of the airplane may be used to aid the participants in reaching the ground.

(d) Except as provided in paragraph (a) of this appendix, only the airplane's emergency lighting system may provide illumination.

(e) All emergency equipment required for the planned operation of the airplane must be installed.

(f) Each internal door or curtain must be in the takeoff configuration.

(g) Each crewmember must be seated in the normally assigned seat for takeoff and must remain in the seat until receiving the signal for commencement of the demonstration. Each crewmember must be a person having knowledge of the operation of exits and emergency equipment and, if compliance with §121.291 is also being demonstrated, each flight attendant must be a member of a regularly scheduled line crew.

(h) A representative passenger load of persons in normal health must be used as follows:

(1) At least 40 percent of the passenger load must be female.

(2) At least 35 percent of the passenger load must be over 50 years of age.

(3) At least 15 percent of the passenger load must be female and over 50 years of age.

(4) Three life-size dolls, not included as part of the total passenger load, must be carried by passengers to simulate live infants 2 years old or younger.

(5) Crewmembers, mechanics, and training personnel, who maintain or operate the airplane in the normal course of their duties, may not be used as passengers.

(i) No passenger may be assigned a specific seat except as the Administrator may require. Except as required by subparagraph (g) of this paragraph, no employee of the applicant may be seated next to an emergency exit.

(j) Seat belts and shoulder harnesses (as required) must be fastened.

(k) Before the start of the demonstration, approximately one-half of the total average amount of carry-on baggage, blankets, pillows, and other similar articles must be distributed at several locations in aisles and emergency exit access ways to create minor obstructions.

(l) No prior indication may be given to any crewmember or passenger of the particular exits to be used in the demonstration.

(m) The applicant may not practice, rehearse, or describe the demonstration for the

participants nor may any participant have taken part in this type of demonstration within the preceding 6 months.

(n) Prior to entering the demonstration aircraft, the passengers may also be advised to follow directions of crewmembers but may not be instructed on the procedures to be followed in the demonstration, except with respect to safety procedures in place for the demonstration or which have to do with the demonstration site. Prior to the start of the demonstration, the pre-takeoff passenger briefing required by §121.571 may be given. Flight attendants may assign demonstration subjects to assist persons from the bottom of a slide, consistent with their approved training program.

(o) The airplane must be configured to prevent disclosure of the active emergency exits to demonstration participants in the airplane until the start of the demonstration.

(p) Exits used in the demonstration must consist of one exit from each exit pair. The demonstration may be conducted with the escape slides, if provided, inflated and the exits open at the beginning of the demonstration. In this case, all exits must be configured such that the active exits are not disclosed to the occupants. If this method is used, the exit preparation time for each exit utilized must be accounted for, and exits that are not to be used in the demonstration must not be indicated before the demonstration has started. The exits to be used must be representative of all of the emergency exits on the airplane and must be designated by the applicant, subject to approval by the Administrator. At least one floor level exit must be used.

(q) Except as provided in paragraph (c) of this section, all evacuees must leave the airplane by a means provided as part of the airplane's equipment.

(r) The applicant's approved procedures must be fully utilized, except the flightcrew must take no active role in assisting others inside the cabin during the demonstration.

(s) The evacuation time period is completed when the last occupant has evacuated the airplane and is on the ground. Provided that the acceptance rate of the stand or ramp is no greater than the acceptance rate of the means available on the airplane for descent from the wing during an actual crash situation, evacuees using stands or ramps allowed by paragraph (c) of this appendix are considered to be on the ground when they are on the stand or ramp.

[Amdt. 25-72, 55 FR 29788, July 20, 1990, as amended by Amdt. 25-79, Aug. 26, 1993; Amdt. 25-117, 69 FR 67499, Nov. 17, 2004]

#### APPENDIX K TO PART 25—EXTENDED OPERATIONS (ETOPS)

This appendix specifies airworthiness requirements for the approval of an airplane-engine combination for extended operations (ETOPS). For two-engine airplanes, the applicant must comply with sections K25.1 and K25.2 of this appendix. For airplanes with more than two engines, the applicant must comply with sections K25.1 and K25.3 of this appendix.

##### K25.1 *Design requirements.*

###### K25.1.1 *Part 25 compliance.*

The airplane-engine combination must comply with the requirements of part 25 considering the maximum flight time and the longest diversion time for which the applicant seeks approval.

###### K25.1.2 *Human factors.*

An applicant must consider crew workload, operational implications, and the crew's and passengers' physiological needs during continued operation with failure effects for the longest diversion time for which it seeks approval.

###### K25.1.3 *Airplane systems.*

###### (a) *Operation in icing conditions.*

(1) The airplane must be certificated for operation in icing conditions in accordance with §25.1419.

(2) The airplane must be able to safely conduct an ETOPS diversion with the most critical ice accretion resulting from:

(i) Icing conditions encountered at an altitude that the airplane would have to fly following an engine failure or cabin decompression.

(ii) A 15-minute hold in the continuous maximum icing conditions specified in Appendix C of this part with a liquid water content factor of 1.0.

(iii) Ice accumulated during approach and landing in the icing conditions specified in Appendix C of this part.

(b) *Electrical power supply.* The airplane must be equipped with at least three independent sources of electrical power.

(c) *Time limited systems.* The applicant must define the system time capability of each ETOPS significant system that is time-limited.

###### K25.1.4 *Propulsion systems.*

(a) *Fuel system design.* Fuel necessary to complete an ETOPS flight (including a diversion for the longest time for which the applicant seeks approval) must be available to the operating engines at the pressure and fuel-flow required by §25.955 under any airplane failure condition not shown to be extremely improbable. Types of failures that must be considered include, but are not limited to: crossfeed valve failures, automatic fuel management system failures, and normal electrical power generation failures.

(1) If the engine has been certified for limited operation with negative engine-fuel-