

Paragraph (c)(1) would provide a definitive criterion for the reliability level of the pressurization prevention system and would read: "The provision must be designed to function after any single failure, or after any combination of failures not shown to be extremely improbable." This criterion is consistent with:

- The interpretation of the general text of the existing rule, and
- The current industry practice for new designs.

The FAA does not intend that the proposed criterion impose a new level of reliability for mechanical vent systems that is more stringent than that established by typical fail-safe designs. However, it would provide a definitive criterion for use in evaluating these vent systems or other systems that may interconnect with the airplane's pressurization system. A means for preventing pressurization that functions with a high degree of reliability despite operator and flightcrew errors would be consistent with NTSB Safety Recommendation A-89-094, described previously, which recommends fail-safe features that account for conceivable human errors.

Paragraph (c)(2) would exempt certain doors that meet the requirements of proposed paragraph (h) from the requirement to have a separate means to prevent pressurization. Generally such doors would have to either remain open, so that pressurization cannot take place, or must close and latch as pressurization takes place. Under this provision, these doors would have to be shown not to create a hazardous condition, assuming single failures in the latching mechanism as well as jams due to failures or debris. This would have to be shown from every possible position during the pressurization process. This proposal formalizes and standardizes previous equivalent level of safety findings made under the provisions of § 21.21(b)(1).

#### Proposed Changes to § 25.783(d)

Paragraph (d) would provide requirements for the detail design and fail-safe features of latching and locking mechanisms. Advisory Circular (AC) 25.783-1 "Fuselage Doors, Hatches, and Exits," dated December 10, 1986, currently recommends some of these design features; the proposed rule would make these features mandatory.

The detail design requirements for latches and locks contained in this proposal are consistent with current industry practice, as applied to doors whose initial movement is not inward. However, the applicability of the proposed requirement would be

extended to any door, regardless of the direction of initial movement.

Paragraph (d) also would require the latching mechanism to be designed to eliminate forces that would drive the latches to the open position. However, the FAA recognizes there still may be ratcheting forces that could progressively move the latches to the unlatched position. Therefore, the rule also would require the latching system to be designed such that the latches are positively secured without regard to the position of the locks.

Proposed paragraph (d)(3)(iii) contains the requirement for a fail-safe criterion for the locking system that would apply only to outward opening doors while under pressure. Since all the locks are usually designed as a single locking system, it is possible that single failures in the locking system could result in the unlocking of several or all the latches. Although the latches would continue to be held in the latched position by the latch system securing means, the FAA has determined that, for the most critical designs, during pressurized flight, single failures in the locking system should not unlock more latches than are needed to restrain the door.

Proposed paragraphs (d)(5) and (6) contain detail requirements for the lock elements and locking system to ensure that they will restrain the latches under anticipated loading conditions, and to ensure that the locks cannot be engaged unless the door is properly latched. Experience has shown these features to be fundamental to the design of a safe door.

Finally, proposed paragraph (d)(7) would exclude the requirement for a locking system from any door for which unlatching was not a hazard. In that case, a locking mechanism would not add to the safety of the door, since unlatching (which is what a locking mechanism is supposed to prevent) does not create a hazardous condition.

#### Proposed Changes to § 25.783(e)

Paragraph (e) would require warning, caution, and advisory indications for doors. These requirements for indication are similar to the current provisions for indication of door status in this section, but provide added features consistent with NTSB and ATA recommendations. The prescribed "improbable" level for an erroneous indication that the door is fully closed, latched, and locked is proposed to be the same as the requirement of existing paragraph (e). However, the applicability would be extended to each door, if unlatching of the door in flight could be a hazard.

Paragraph (e) also would require an aural warning before takeoff for any door that is not fully closed, latched, and locked if opening of the door would not allow safe flight. The FAA has determined that this requirement is necessary, based on service history, including the crash of an airplane shortly after takeoff as a result of aerodynamic interference from an open cargo door. This system should function in a manner similar to the takeoff configuration warning systems required by § 25.703 ("Takeoff warning system").

Paragraph (e) also would require that there be a positive means to display indications and signals to the door operator. This proposed requirement is consistent with NTSB Safety Recommendation A-89-093, discussed previously.

#### Proposed Changes to § 25.783(f)

This proposal would revise paragraph (f) to require a provision for direct visual inspections to determine that the door is fully closed, latched, and locked. The specific location and quantity of the viewing means would depend on the specific design, but might not require a viewing means for each lock, provided that the number of visual indicators provided would not give a false indication. This proposed requirement is similar to that of the existing paragraph (b), which requires a means for direct visual inspection of the locking mechanism. However, this proposal would extend the requirements to apply to any door, irrespective of the direction of initial movement, if the unlatched door could be a safety hazard.

#### Proposed Changes to § 25.783(g)

This proposal would revise paragraph (g) to provide relief from certain requirements of the current rule that are applicable to access panels not subject to pressurization and for which opening would be inconsequential to safety. In addition, the proposal would provide relief from certain of the current requirements applicable to:

- Maintenance doors that are not a safety hazard if opened; and
- Removable emergency exits, because they are not used in normal operation and therefore not subjected to the same level of human error, abuse, and damage as other doors and hatches.

#### Proposed Changes to § 25.783(h)

Paragraph (h) would prescribe detail design features that a door would need to have if it were to be considered as a door that is "not a hazard" when this phrase is used in other paragraphs of § 25.783. This paragraph effectively defines the criteria under which a door