



U.S. Department  
of Transportation

Federal Aviation  
Administration

M-494.6

# Advisory Circular

Subject: EMERGENCY EVACUATION  
DEMONSTRATION FROM  
SMALL AIRPLANES

Date: 7/12/83  
Initiated by: ACE-100

AC No: 20-118  
Change:

1. PURPOSE. This advisory circular sets forth acceptable means, but not the only means, of showing compliance with the Federal Aviation Regulations (FAR) applicable to required emergency evacuation demonstrations from small airplanes with a passenger seating capacity, excluding pilot seats, of 10 or more.
2. RELATED FAR SECTIONS.
  - a. Section 32 of Special Federal Aviation Regulation (SFAR) 23.
  - b. Section 5 of SFAR 41.
  - c. Sections .87, .117, .123, .169 and Appendix A of FAR Part 135.
3. BACKGROUND. Airworthiness regulations and operating rules require emergency evacuation demonstrations be conducted from small airplanes with a passenger seating capacity, excluding pilot seats, of 10 or more. The purpose for conducting an emergency evacuation demonstration is to ensure that all occupants can evacuate the airplane safely following a minor crash landing or ground mishap.
4. MEANS OF COMPLIANCE.
  - a. Test Conditions.
    - (1) Safety of Participants. Personnel participating in the demonstration should be protected from potential injury without compromising the test results. It is the responsibility of the applicant conducting the demonstration to take such precautions as may be necessary to prevent injury to the participants. As a precaution to protect evacuees from injuries, nonparticipating personnel may be stationed at strategic locations outside the airplane, but they should not provide any assistance during the evacuation. The use of ramps or stands is acceptable to assist personnel in descending from the wings when overwing exits are used, provided the acceptance rate of the ramp or stand is no greater than the acceptance rate of the means available on the airplane for descent from the wing.
    - (2) Participant Composition. To simulate an average passenger distribution, and to avoid the use of participants under 18 or over 60 years of age, the following age/sex distribution of participants has been found acceptable for emergency evacuation demonstrations from small airplanes:
      - (i) At least 25 percent of the participants should be over 50 years of age with at least 40 percent of this group being female.

(ii) The remaining participants may be 50 years of age or younger with at least 30 percent of this group being female.

(iii) If additional tests are anticipated, another group of participants should be available. The related regulations prohibit prior practice or rehearsal by the participants for the demonstration. Participating crewmembers should have knowledge of the operation of the exits and emergency equipment.

(3) Compliance inspection.

(i) Determine that all emergency equipment is approved and installed in the airplane.

(ii) Evaluate escape routes to ensure that the most critical egress has been determined. Where applicable, the main boarding/exit door should be blocked to ensure the most critical egress route is used.

(iii) Verify that the available emergency exits on the critical side of the airplane may be used and exits on the noncritical side are unusable by simulating fire, smoke, or other acceptable means.

(iv) Determine that deactivated or blocked exits are not evident to the participants prior to the evacuation.

(v) Determine that the lighting simulates the night lighting conditions, i.e., no moonlight or starlight will exist during the evacuation test. Lighting may be allowed at ground level to aid in leaving the area near the airplane providing the lighting is kept low and shielded so it does not aid in evacuating the airplane.

(vi) Emergency lighting is not required by SFAR 23, SFAR 41, Appendix A of FAR Part 135, and FAR Part 23. If the applicant desires to use emergency lighting in the design as an aid for emergency evacuation, the emergency lighting should be operable following a survivable crash landing.

(vii) Interior Configuration. Before the start of the evacuation demonstration, ensure that the cockpit and passenger compartment are in the normal takeoff/landing configuration. Factors to consider include:

(A) Seat backs in upright position.

(B) Seat belts and shoulder harnesses (if required) operable.

(C) Each adjustable seat is in its most adverse track position that is approved for takeoff and landing.

b. Evacuation Preparation.

(1) Airplane should be in a normal attitude with the landing gears extended.

(2) The maximum number of participants for which approval is requested should be escorted into the airplane such that they cannot see the exterior to determine which exits are to be inoperable during the timed evacuation.

(3) After the participants are seated in the airplane and with safety belts and shoulder harnesses fastened, if required, they will receive an oral briefing by test personnel or participants acting as crewmembers. The briefing should be equivalent to the briefing required by FAR 135.117 on the location and means for opening the passenger entry door and emergency exits. All participants should be told the purpose of the demonstration; that is, to demonstrate a rapid emergency evacuation of the airplane.

(4) Before the evacuation begins, reasonable time should be allowed for the participants to become adjusted to the subdued lighting of the normal night lighting environment of the airplane.

(5) Immediately prior to the timed demonstration, blankets, pillows, and carry-on type baggage that is permitted by FAR 135.87 should be randomly distributed at locations in the aisles and in all emergency exits access ways to create minor obstructions simulating a minor crash environment within the passenger compartment. One piece of carry-on type baggage for each three participants and one blanket and pillow for each five participants is acceptable for use as minor obstructions for evacuation demonstration purposes.

c. Evacuation.

(1) The timed demonstration begins immediately following the announcement "Evacuate Airplane."

(2) Evacuation time should be measured to the nearest second.

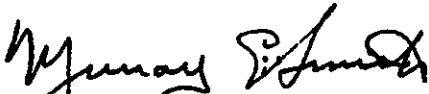
(3) The flight crew participants are considered incapacitated for giving assistance in accordance with FAR 135.123 and they should not assist other participants during the evacuation. Injuries to the flight crew may prevent their assisting in an actual minor crash situation.

(4) Night lighting of the cockpit and passenger compartment should be made inoperative immediately following the "Evacuate Airplane" announcement. Emergency lighting provisions, if approved, may be used; otherwise, only the lighting from the "Exit" signs is acceptable.

d. Test Results.

(1) The evacuation is completed when the last occupant reaches the ground (stand or ramp if authorized for the test).

(2) The airworthiness regulations and operating rules set forth the maximum allowable time to complete the evacuation demonstration. The maximum allowable time to complete the evacuation is 90 seconds.

  
Murray E. Smith  
Director, Central Region

Page 4

Par. 4

U.S. Department  
of Transportation

**Federal Aviation  
Administration**

800 Independence Ave., S.W.  
Washington, D.C. 20591

Official Business  
Penalty for Private Use \$300

**RETURN POSTAGE GUARANTEED**

Postage and Fees Paid  
Federal Aviation  
Administration  
DOT 515



**THIRD CLASS BULK RATE**