
Volume 3. Air Operator Technical Administration

CHAPTER 10. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS

SECTION 2. THE ABORTED TAKEOFF EMERGENCY EVACUATION DEMONSTRATION

1693. THE ABORTED TAKEOFF DEMONSTRATION: PHASE ONE.

A. The regulatory requirements previously outlined in this chapter identify the three occasions when a Title 14 of the Code of Federal Regulations (14 CFR) part 121 operator must conduct an emergency evacuation demonstration. An emergency evacuation demonstration is required when the operator proposes to operate a specific airplane type and model:

- For the first time (either a new or existing operator)
- When there is a “significant change” in the number of flight attendants, their seating location, their evacuation duties, or emergency procedures (as determined by the principal operation inspector (POI) or Cabin Safety Inspector (CSI))
- When there is a change in the number, location, type of emergency exits, or type of opening mechanism on the emergency exits used for aircraft evacuation (as determined by AFS-200)

NOTE: All determinations about significant changes and the need for an evacuation demonstration will be made by the POI and CSI, if applicable. This determination should be coordinated by the POI with the regional office, through the certificate holding district office (CHDO). If needed, the regional office may coordinate with AFS-200.

NOTE: If an operator proposes to conduct operations with an aircraft configured with less than 44 seats (even though the aircraft may have been previously type-certificated with more than 44 seats) neither a full-scale nor a partial demonstration is required.

B. When an operator’s situation meets one or more of these conditions, the principal inspector (or Certification Project Manager (CPM)) must determine the requirement for either a full-scale or a partial aborted takeoff evacuation

demonstration.

(1) A full-scale demonstration is required in the following situations:

(a) When the airplane type and model and its proposed full passenger seating capacity has not been previously demonstrated by another U.S. operator (in accordance with 14 CFR part 121 § 121.291(a) in effect on October 24, 1967) or by a U.S. or foreign manufacturer (in accordance with 14 CFR part 25 § 25.803 in effect on December 1, 1978 and § 121.291(a)).

(b) When an airplane has undergone a change in its exit configuration and/or design (as determined by AFS-200).

(2) A partial demonstration is required in the following situations:

(a) When an airplane (new to an operator) has previously had a full-scale demonstration, conducted by a part 121 operator or manufacturer, for the maximum seating configuration to be used by the operator acquiring the airplane.

(b) When the operator is undergoing original certification.

(c) If the POI determines that a change has occurred in the number of flight attendants, their location, or their duties and emergency procedures.

(d) If AFS-200 determines a change has occurred in seating configuration, exits, or some other material alteration of the airplane’s original design that would require a partial demonstration.

C. The most commonly performed demonstration is the partial aborted takeoff emergency evacuation demonstration. The general criteria (with the exception of the 15 second time limit and passenger participants) is similar to the full-scale aborted takeoff demonstration. For the purposes of this handbook, the discussion of the partial and full-scale evacuation demonstration process is combined into one section. Additional requirements, exclusively imposed by the full-scale evacuation demonstration, are shown in an

appropriately titled box as in the following illustration.

FULL-SCALE DEMONSTRATION

1695. BRIEFING THE OPERATOR ON DEMONSTRATION REQUIREMENTS. After the principal inspectors (CPM if applicable) determine whether a partial or full-scale demonstration is required, the operator must develop a plan outlining the manner in which the demonstration is to be conducted. Federal Aviation Administration (FAA) inspectors must meet with the operator as often as necessary to ensure the operator clearly understands which documents and information are required for the plan to be accepted for evaluation. The operator shall be given the following information in addition to the specific information described in paragraph 1697 of this section.

FULL-SCALE DEMONSTRATION

A. In a full-scale aborted takeoff emergency evacuation demonstration, the operator must assemble a representative passenger complement in accordance with part 121, Appendix D(a)(7). The operator must ensure the passenger participants meet the following criteria before conducting the demonstration. If passenger participants do not meet the criteria, the operator shall be required to repeat the demonstration.

(1) They must be representative of a normal passenger complement as outlined in the following table.

Passengers	Age	Percentage of Full Seating Capacity
Adult Females	12-50	40% minimum
Adult Males	12-50	60% maximum
Adult Males and Females (Proportionate mix)	over 50	35% minimum of which at least 15% must be female.
Life-sized dolls	---	3

(2) The “life-sized dolls” referred to above must be carried by passengers to simulate infants 2 years or younger.

(3) None of the passengers may be crewmembers, mechanics, or training personnel who maintain or operate the airplane.

(4) No employee of the certificate holder or manufacturer may be seated next to an exit.

(5) It may not always be possible to have children between the ages of 3 through 11 participating in a full-scale evacuation demonstration due to child labor laws in force in certain localities. In these situations a proportionate mix of the overall passenger complement may be substituted.

B. The operator may not practice, rehearse, or describe the demonstration for the passengers nor may any participant have taken part in this type of demonstration within the preceding six months.

C. Company officials, such as directors of operations and maintenance or their representatives, must be available at the site for either a full-scale or partial demonstration. These individuals must have authority to direct modifications to the emergency evacuation demonstration plan at the time of

the demonstration. Additionally, they must be able to respond to FAA requirements for specific corrective actions due to deficiencies which occur during the demonstration. Other company personnel present at the demonstration site should have a direct role in conducting the demonstration.

The company should be informed that, although other company personnel may observe the demonstration, it is the

company's responsibility to ensure that these persons do not pose a distraction or affect the demonstration's outcome.

FULL-SCALE DEMONSTRATION

D. The company should provide safety personnel at strategic locations around the aircraft to protect passenger participant evacuees in a full-scale evacuation demonstration. Safety personnel shall not provide any assistance to crewmembers such as positioning slides, assisting evacuees through exits, or in any manner that contributes to the efficiency of the evacuation. Safety personnel are used only to ensure passengers are not injured from accidents such as slipping off wings or falling from exits.

E. Non-company personnel, who are not FAA personnel, must have specific reasons to observe the emergency evacuation demonstration. Usually these individuals will be representatives of the aircraft manufacturer, manufacturers of other items of equipment used during the demonstration, or other such organizations which have a direct interest in aviation safety.

F. The flight attendant complement must consist of the minimum number of flight attendants which the operator proposes to use on the airplane during part 121 operations, and in no case shall the minimum number be less than that specified in § 121.391.

G. The airplane must be positioned in a normal ground attitude and configured for takeoff. Each passenger compartment door or curtain must be positioned as it would be for a normal takeoff.

1697. THE OPERATOR'S PLAN. Section 121.291(c)(2) requires the operator to obtain FAA approval before conducting the emergency evacuation demonstration (full-scale or partial). The operator should submit the plan as far in advance as possible. However, FAA policy is that the plan must be submitted at least 30 working days in advance of a full-scale demonstration and 15 working days

in advance of a partial demonstration. The operator's plan shall contain the following information:

A. A letter of request which states the following:

(1) The applicable regulation (§ 121.291(a) or (b)), which requires a full-scale or partial emergency evacuation demonstration be conducted.

(2) The airplane type and model and full seating capacity (including crewmembers) to be demonstrated.

NOTE: Section 7 lists the maximum seating capacity previously demonstrated for air transport category airplanes used in part 121 operations.

(3) The number of flight attendants and their duty assignment positions to be used during the demonstration.

(4) The proposed date, time, and location of the evacuation demonstration.

(5) The name and telephone number of the company's evacuation demonstration coordinator (spokesman).

FULL-SCALE DEMONSTRATION

(6) For a full-scale demonstration, a statement that the representative passenger complement will meet the requirements set forth in part 121, Appendix D, (a)(7). (See paragraph 995A.)

(7) A clear description of how the operator proposes to initiate the demonstration, the signal to be used for the purpose of timing, and how the operator intends to block exits which are not to be used, must also be in the plan. The operator must understand that the signal has to be given to both cabin and ground personnel simultaneously to initiate

the demonstration. It should be emphasized that the operator is responsible for developing the initiation procedure and the method for blocking exits. The team leader will thoroughly review this procedure for adequacy.

B. A diagram, representative of the airplane to be

demonstrated, which includes the following:

(1) The location and designation of all exits by type and the designated exit pairs.

(2) The assigned seating location of each required crewmember during takeoff.

(3) The interior cabin configuration showing the location of each passenger seat, the galleys, aisles, lavatories, and passenger compartment partitions and bulkheads.

(4) The location and type of emergency and safety equipment on the aircraft including, but not limited to:

- Fire extinguishers
- Portable oxygen bottles/masks
- Megaphones
- Crash axes
- Emergency ropes/tapes
- Liferrafts/sliderafts/emergency stairs
- Individual flotation devices or life preservers
- First aid and emergency medical kits and protective gloves
- Protective Breathing Equipment
- Automated External Defibrillator (if applicable)
- Enhanced Emergency Medical Kits (if applicable)
- Survival Kits (if applicable)
- Flashlights
- Door Warning Flag (door arm strap, if applicable)
- Signaling Devices (overwater)
- Survival Radios (overwater)
- Door Restraining/Barrier Strap (if applicable)

C. Copies of the appropriate crewmember manual pages describing emergency evacuation duties and responsibilities.

D. A copy of the passenger safety information briefing card which will be used on the aircraft during revenue operations.

E. A description of the emergency equipment installed on the aircraft including at least the type and model of each item of equipment, as applicable.

F. A list of crewmembers (both flight deck and cabin), who are or will be qualified to participate in the demonstration must be in the operator's plan. The flightcrew must be qualified in the aircraft to be used. However, the initial operating experience requirement need not be completed. Flight attendant personnel (in accordance with § 121.291(c)(3)) must have completed an FAA-approved

training program for the type and model of aircraft being demonstrated. Flight attendants designated by the FAA to participate in the demonstration shall not be provided emergency training or aircraft emergency equipment familiarization more than that specified in the operator's approved training program before the demonstration.

NOTE: The flightcrew must take no active role in assisting others inside the cabin during the demonstration.

G. A description must be in the plan of how the operator will ensure the demonstration is conducted in the "dark of the night," or in conditions which simulate the "dark of the night." The regulations do not define "dark of the night." For the purpose of emergency evacuation demonstrations, "dark of the night" means a level of illumination that approximates the natural illumination that occurs 90 minutes after official sunset under clear sky conditions. This lower level of illumination is needed to properly evaluate the airplane's emergency lighting system and passenger and crewmember performance in darkened conditions. Levels of illumination significantly darker can interfere with a proper evaluation of the demonstration. Therefore, this approximate level of illumination should be maintained by natural or artificial means. The most effective way of controlling the level of illumination is to conduct the demonstration in a darkened hangar. Part 121, Appendix D, (a)(1), specifies that the full evacuation demonstration must be conducted during the "dark of the night." Although § 121.291(c) stipulates criteria for the "partial" demonstration, it does not specifically require "dark of the night" conditions. It is FAA policy that such conditions are required for evaluating the aircraft's emergency lighting system and the performance of the crewmembers in a darkened environment. The use of window shades in the down or partially lowered position could also be effective in achieving the objective of "dark of the night" in the cabin by preventing exterior lighting from entering the cabin. The combination of the interior cabin lights set to simulate a night-time departure in conjunction with the window shades in the down or partially lowered position may provide a more definitive indication of the activation of the cabin interior emergency lights and the commencement of the demonstration drill. Additionally, window shades in the down or partially lowered position could maintain flight attendant concentration inside the aircraft and be prevented from observing pre-demonstration activities occurring outside the aircraft. The use of window shades in the down or partially lowered position should not conflict with established carrier procedures on the position of window shades for the demonstration drill. For example, if a carrier has an established procedure of having window shades in the open or up position for take-off and landing due to cabin configuration and/or flight attendant assessment duties, the demonstration drill should replicate the normal cabin configuration. The FAA team leader should exercise good

judgment if the window shades are to be placed in the down or partially lowered position for the demonstration drill.

H. A description of how the operator plans to ensure that the airplane is positioned in a location, either indoors or outdoors, which will allow the unobstructed deployment of all emergency stairs, evacuation slides or sliderafts, as applicable.

1699. THE ABORTED TAKEOFF DEMONSTRATION: PHASE TWO. When the operator's emergency evacuation demonstration plan is submitted, the principal inspectors or the certification team, if applicable, must make a cursory review of the submission to ensure all the required information and documents discussed in phase one are included. While a thorough analysis of the submission is conducted during phase three, in phase two the FAA should respond to the operator's plan in a timely manner. Minor omissions or deficiencies can often be resolved by contacting the company's evacuation demonstration coordinator. If discrepancies can be resolved quickly, the process moves to phase three. If the operator's plan has a significant number of required items or documents missing or is obviously incomplete, the entire submission must be returned to the operator with a written explanation of why it is unacceptable. The operator shall be advised that FAA will take no further action until an acceptable plan is submitted.

1701. THE ABORTED TAKEOFF DEMONSTRATION: PHASE THREE. During phase three the principal inspectors or the certification team, if applicable, conduct a thorough analysis and evaluation of the operator's plan.

A. The principal inspectors (or CPM, if applicable) must ensure that the information in or attached to the operator's letter of request is acceptable and consistent with the proposed type of demonstration. During this analysis and review the POI shall ensure the following:

(1) FAA has approved operator's emergency training program.

(2) Evacuation procedures in the operator's manuals, including individual crewmember assignments, are realistic, can be practically accomplished, and comply with § 121.397(a) and (b).

(3) The passenger safety information briefing card is understandable and consistent with the type and model of airplane to be demonstrated. Guidance is provided in the

most recent version of AC 121-24, "Passenger Safety Information Briefing and Briefing Cards."

(4) The emergency equipment is acceptable for the type of operation proposed.

B. Certain items in the proposal may require on-site evaluations. For example, the hangar or ramp area the operator intends to use for the demonstration should be inspected for its adequacy. The inspector should determine that the operator has, or is making provisions for participant safety during the demonstration including the use of safety observers, stands, padding, mats, and any other appropriate safety measures.

C. Deficiencies noted during this analysis and review must be resolved with the company's evacuation demonstration coordinator. If major discrepancies surface during the FAA evaluation or if FAA and the operator are unable to resolve significant issues, the operator's plan must be returned with a letter explaining why it is being returned. The operator shall be informed that the discrepancies outlined in the letter must be corrected and a plan resubmitted before the FAA takes further action. If, after a detailed evaluation, the submission is found acceptable, the operator shall be notified that it has been accepted by FAA.

1703. THE ABORTED TAKEOFF DEMONSTRATION: PHASE FOUR. During phase four, FAA plans, observes, and evaluates the operator's aborted takeoff emergency evacuation demonstration. The planning segment of this phase is particularly important and normally requires thorough coordination and clear instruction and guidance for both FAA and company participants to ensure that the demonstration is conducted and evaluated objectively. Specific guidance and instruction for planning and conducting the full-scale and partial aborted takeoff evacuation demonstrations are in Section 3.

1705. THE ABORTED TAKEOFF DEMONSTRATION: PHASE FIVE. Upon successful completion of an aborted takeoff emergency evacuation demonstration, the operator shall be immediately notified at the site of the demonstration. The results of the demonstration are reported as specified in section 6. The maximum demonstrated passenger seating capacity and the minimum required number of flight attendants for that airplane type and model must be listed and approved in Part A, paragraph A003 of the operations specifications.

1706-1710. RESERVED.

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