



Advisory Circular

Subject: Demonstration of Emergency Evacuation and Ditching Procedures – Private Operators

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1.0 Introduction

- (1) This Advisory Circular (AC) is provided for information and guidance purposes. It describes an example of an acceptable means, but not the only means, of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend or permit deviations from regulatory requirements, nor does it establish minimum standards.

1.1 Purpose

- (1) The purpose of this document is to provide direction and guidance for planning, conducting, observing, and evaluating demonstrations of emergency evacuation and ditching procedures. Effective emergency evacuation procedures have significantly reduced the number of casualties in survivable aeroplane accidents. Transport Canada considers an operator's ability to perform these procedures to be an important factor in aviation safety.

1.2 Applicability

- (1) This document applies to operators of Canadian private aircraft configured for 20 or more passengers that are required to operate pursuant to Part VI, Subpart 4 of the *Canadian Aviation Regulations* (CARs).

1.3 Description of changes

- (1) This issue of the document was revised to:
 - (a) add information regarding expectations when an operator has previously carried out a successful demonstration of its emergency evacuation procedures for another model of aeroplane in its fleet;
 - (b) clarify expectations associated with the conduct of ditching demonstrations; and
 - (c) update the list of aeroplane models in Appendix A.
- (2) With the exception of minor editorial changes and updated references, the remaining content is unaltered.

2.0 References and requirements

2.1 Reference documents

- (1) It is intended that the following reference materials be used in conjunction with this document:
 - (a) [Aeronautics Act](#) (R.S.C., 1985, c. A-2)
 - (b) Part VI, Subpart 4 of the *Canadian Aviation Regulations* (CARs) — Private Operators
 - (c) Standard 624 of the CARs — Emergency Features of the General Operating and Flight Rules Standards
 - (d) Chapter 525 of the *Airworthiness Manual* (AWM) — Transport Category Aeroplanes
 - (e) Advisory Circular (AC) SUR-002, 2015-09-15 — Root Cause Analysis and Corrective Action for TCCA Findings
 - (f) International Civil Aviation Organization (ICAO) Doc 8335, Fifth Edition, 2010 — Manual of Procedures for Operations Inspection, Certification and Continued Surveillance

- (g) ICAO Doc 10062, First Edition, 2017 — Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents
- (h) ICAO Doc 10072, First Edition, 2017 — Manual on the Establishment of Minimum Cabin Crew Requirements
- (i) United States Title 14 Code of Federal Regulations (CFR) Part 125 — Certification and Operations: Airplanes having a seating capacity of 20 or more passengers or a maximum payload capacity of 6,000 pounds or more; and rules governing persons on board such aircraft
- (j) United States, 45 Federal Register 67214-67259, 1980-10-09 — Certification and Operation Rules for Certain Large Aeroplanes (14 CFR § 125.189)
- (k) Federal Aviation Administration (FAA) Order 8900.1, Volume 3, Chapter 30, 2018-02-22 — Emergency Evacuation and Ditching Demonstrations
- (l) FAA Advisory Circular (AC) 20-118A, 1987-03-09 — Emergency Evacuation Demonstration
- (m) FAA AC 25.803-1A, 2012-03-12 — Emergency Evacuation Demonstrations
- (n) FAA Air Carrier Operations Bulletin 222, 1994-01-21 — Crewmember Training for Emergency Evacuation Demonstrations
- (o) SAE Technical Paper 821486, 1982-02-01 — An FAA Analysis of Aircraft Emergency Evacuation Demonstrations

2.2 Cancelled documents

- (1) Not applicable.
- (2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

2.3 Definitions and abbreviations

- (1) The following **definitions** are used in this document:
 - (a) **Able bodied passenger (ABP):** For the purpose of this document, a participant in the demonstration who represents an aeroplane passenger that is physically able and willing to assist the flight attendant(s).
 - (b) **Code of Federal Regulations (CFR):** The general and permanent rules published in the United States Federal Register by the executive departments and agencies of the United States Federal Government.
 - (c) **Ditching/evacuation demonstration coordinator:** The individual assigned by the applicant or operator to organize and conduct the demonstration.
 - (d) **Extended over-water operation:** A flight over an area of water located at a horizontal distance of more than 50 nautical miles from the nearest shoreline.
 - (e) **Floor-level emergency exit:** An exit meeting the definition of Type I, II, A, B, or C as described in section 525.807 of the *Airworthiness Manual*.
 - (f) **Layout of passenger accommodations (LOPA):** An engineering diagram of the aeroplane cabin interior that includes, but is not limited to, the location of passenger and flight attendant seats, emergency equipment, exits, lavatories, and galleys.
 - (g) **Model:** For the purpose of this document, means “aircraft master series” as described in section 3.7 of version 1.3 of the document entitled *International Standard for Aircraft*

Make, Model, and Series Groupings dated October 2012 and published by the Common Taxonomy Team of the International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST). Each air operator certificate also contains the aircraft master series for each registered aircraft. Appendix A to this advisory circular contains a summary list of aeroplane models.

- (h) **Non-floor-level emergency exit:** An exit typically meeting the definition of Type III, IV, Ventral, or Tail cone as described in section 525.807 of the *Airworthiness Manual*. This may consist of a door, hatch or openable window.
 - (i) **Operator:** For the purpose of this document, an air operator or a private operator.
 - (j) **Passenger cabin:** The portion of the aeroplane normally occupied or accessed by passengers during taxi, takeoff, landing, and while in flight, including galleys, closets and lavatories.
 - (k) **Passenger compartment:** An area of the passenger cabin separated from the rest of the passenger cabin by features such as class dividers, galleys, closets, and lavatories.
 - (l) **Rejected takeoff:** A planned takeoff that is discontinued for reasons such as conflicting traffic, aircraft malfunction, weather, or takeoff surface obstacles.
 - (m) **Seating capacity:** The number of seats authorized under the aircraft type certificate or production data, supplemental type certificate, or other Transport Canada approved data.
 - (n) **Seating configuration:** As part of an approved interior, the number of seats selected by the operator and installed on the aircraft in a specific arrangement that does not exceed the seating capacity.
 - (o) **Shall:** Usage of this verb form indicates a mandatory criterion.
 - (p) **Should:** Usage of this verb form indicates a criterion that is recommended unless the alternative is documented and justified.
- (2) The following **abbreviations** are used in this document:
- (a) **ABP:** able bodied passenger
 - (b) **AWM:** *Airworthiness Manual*
 - (c) **CARs:** *Canadian Aviation Regulations*
 - (d) **FAA:** Federal Aviation Administration
 - (e) **LOPA:** layout of passenger accommodations
 - (f) **TCCA:** Transport Canada Civil Aviation

3.0 Emergency evacuation and ditching demonstrations — general

3.1 Background

- (1) The requirements for emergency evacuation demonstrations were first established in the United States in 14 CFR Part 121 (section 121.291) by Amendment 121-2, effective March 3, 1965. Air operators were required to conduct full-scale evacuation demonstrations within a time limit of two minutes using 50% of the exits. The purpose of the demonstration was to validate a crew member's abilities to execute the established emergency evacuation procedures and to ensure realistic assignment of functions to the crew. A full-scale demonstration was required upon:
- (a) initial introduction of a model of aeroplane into passenger-carrying operation;
 - (b) an increase in passenger seating capacity of five percent or greater; or

- (c) a major change in the cabin interior that would affect emergency evacuation.
- (2) The requirement for the aeroplane manufacturer to conduct an evacuation demonstration for aeroplanes having a seating capacity of more than 44 passengers was established in 14 CFR Part 25 (section 25.803) by Amendment 25-15, effective October 24, 1967. The time limit for the manufacturer's demonstration was established at 90 seconds, and the Part 121 time limit for air operators was reduced to 90 seconds. It was considered that the manufacturer's demonstration would show the basic capability of a new aeroplane while the Part 121 demonstration was intended to account for crew training and adequate crew procedures. Therefore, the demonstration conditions were somewhat different.
 - (3) Since Amendment 25-15, numerous full-scale demonstrations have been conducted by aeroplane manufacturers to satisfy both type certification and operational requirements. These demonstrations provided data on evacuation rates, escape system performance, and the behaviour of evacuees (passengers and crew members who evacuate the aeroplane) during the demonstration.
 - (4) In Amendments 25-46 and 121-149, effective December 1, 1978, section 25.803 was revised to replace the existing Part 25 demonstration conditions with conditions that would satisfy both Part 25 and Part 121 so one demonstration could serve both requirements. Part 25 was changed to match the conditions in Part 121.
 - (5) Amendment 25-46 also removed the provision which allowed analysis alone and instead required a combination of analysis and tests to assure approvals would be based on sufficient test data. The possibility was considered that sufficient data may not be available in the case of a completely new aeroplane model, a model that had major changes made to it, or a previously approved model with considerably greater passenger capacity. Thus, the requirement that the FAA Administrator find the data used in the analysis acceptable was intended to preclude approvals which might be based on insufficient test data to support the proposed analysis.
 - (6) 14 CFR Part 125 was introduced in 1980 to govern the operation of U.S. registered airplanes certificated to carry 20 or more passengers or a maximum payload of more than 5,000 pounds provided the airplane would not otherwise be operated under Part 121, 135 or 137. Section 125.189 specifies the requirement to conduct a demonstration of emergency evacuation procedures and Appendix B to Part 125 specifies the criteria for the demonstrations.
 - (7) Amendment 121-176, effective January 18, 1982, allowed a Part 121 air operator to use the results of a Part 25 demonstration or the Part 121 demonstration of another air operator to show compliance with the full demonstration requirements of section 121.291. The required partial demonstration would show that the specific air operator procedures, training program and maintenance program are adequate.
 - (8) Amendment 25-79 revised Appendix J by changing the age/gender mix to be used when aeroplane manufacturers conduct an emergency evacuation demonstration, by prohibiting flight crew member assistance, and by allowing the use of stands or ramps for descending from overwing exits only when the aeroplane is not equipped with an off-wing descent means.
 - (9) Amendment 25-117 revised Appendix J by including provisions to reduce the potential for participant injuries. This included provisions for pre-deployed escape slides, a low level of ambient lighting in the test facility, and briefing participants on the safety precautions taken for the demonstration.
 - (10) Over the years, the international exchange of aeronautical products has driven the need for those products to be certified to common standards. In July 1986, the Canadian AWM introduced Canadian standards based on the equivalent requirements in the U.S., including Amendment 25-59, effective November 26, 1984. This included the emergency evacuation provisions of 14 CFR 25.803, which are harmonized with section 525.803 of the AWM.

3.1.1 Emergency evacuation demonstration — 15-second time limit

- (1) As noted at 3.1(7) above, Amendment 121-176 introduced the ability for a Part 121 air operator to use the results of a successful emergency evacuation demonstration conducted either by a manufacturer under 14 CFR Part 25 or by another Part 121 air operator and to conduct a partial demonstration of emergency evacuation procedures if certain conditions are met. The amendment reduced the number of demonstrations, reduced the exposure to injury of participants required in those demonstrations, and maintained an acceptable level of safety.
- (2) The FAA conducted a study to ensure that the safety standards in this amendment would be equivalent to those provided by the previous regulation. The FAA examined over 10 years of data on emergency evacuation demonstrations. The data consisted of 251 evacuation demonstrations conducted before 1967 when 14 CFR 121.291 required air operators to demonstrate total evacuation within 120 seconds; 259 evacuation demonstrations conducted under the subsequent rule that required air operators to demonstrate total evacuation within 90 seconds; and 90 partial demonstrations conducted under exemption where flight attendants demonstrated their ability to ready the exits and escape slides within 15 seconds with no passengers involved.
- (3) Data on evacuation demonstrations conducted under the rule requiring total evacuation within 90 seconds were analyzed and compared to demonstrations conducted under exemptions (exits and escape slides ready within 15 seconds). In 136 evacuation demonstrations conducted under the 90-second rule, the average time taken to ready the exits and escape slides for the first passenger to evacuate was 19.5 seconds. By comparison, in 60 partial evacuations conducted under exemptions, the average time to ready the exits and escape slides was 13.4 seconds. This is 6.1 seconds less than the average time to ready the exits and escape slides during a demonstration conducted under the 90-second rule.
- (4) The reduced time to ready the exits and escape slides in a partial evacuation may be explained in part by the lack of passenger interference. However, 134 total evacuation demonstrations under the 90-second rule were examined to determine the average time to evacuate the last person when the exits and escape slides were ready in 15 seconds or less and when they were ready in more than 15 seconds. In the 53 evacuation demonstrations where the exits and escape slides were ready in 15 seconds or less, the average time to evacuate the last person was 75.9 seconds. In the 81 remaining evacuations where the exits and escape slides were ready in more than 15 seconds, the average time to evacuate the last person was 78.6 seconds.
- (5) When the exits and escape slides were ready in 15 seconds or less, a savings of 2.7 seconds was achieved in the average time to evacuate the aeroplane as compared to those tests in which it took more than 15 seconds to ready the exits and escape slides. Thus, the partial demonstration under the exemptions required the air operator to exhibit faster execution of a vital phase of the evacuation process than is exhibited under the 90-second rule. Concentration and compression of the crucial exit/escape slide preparation phase allows more time for the passenger evacuation phase and, therefore, establishes a more stringent safety standard than the previous 90-second rule.

3.2 Regulatory requirements

- (1) Paragraph 525.803(c) of the AWM and sections 604.223, 604.224, 604.225, 604.226, 705.204, 705.205, 705.206 and 705.207 of the CARs specify the requirements for conducting these demonstrations, when they shall be performed, how they are to be conducted, and the specific criteria which the operator or manufacturer shall meet.
- (2) For private operators and airline operators, these requirements specify the following two types of evacuation demonstrations:
 - (a) demonstration of emergency evacuation procedures; and
 - (b) demonstration of emergency evacuation procedures — ditching.

3.3 Private operator demonstrations

- (1) A demonstration of emergency evacuation procedures is required when an operator proposes operating a specific aeroplane model having a seating configuration of 44 or more passenger seats and:
 - (a) the aeroplane model is entering into service for the first time (e.g., an operator currently operates the Boeing 737-200C model and will be adding the Boeing 737-800 model to its fleet);
 - (b) there is a difference in the number of flight attendants, their seating locations, their emergency evacuation duties or procedures; or
 - (c) there is a difference in the number, location, or type of emergency exits, or type of opening mechanism on the emergency exits.

Note: If an operator proposes to operate an aeroplane configured with fewer than 44 seats, even though the aeroplane may have been previously type certificated with more than 44 seats, no demonstration is required.
- (2) A ditching demonstration is required when an operator proposes operating a specific aeroplane model in an extended over-water operation and that aeroplane is required to have survival equipment in accordance with section 602.63 of the CARs.
- (3) During the demonstration the following areas are evaluated:
 - (a) the operator's emergency training program;
 - (b) crew member competency;
 - (c) the operator's emergency evacuation and ditching procedures; and
 - (d) the serviceability of the emergency equipment on the aeroplane.

3.4 Aeroplane manufacturer demonstrations

- (1) Paragraph 525.803(c) of the AWM requires an applicant for a transport category aeroplane type certificate with a seating capacity of more than 44 passengers to show that the maximum seating capacity can be evacuated from the aeroplane to the ground under simulated emergency conditions within 90 seconds. Compliance with this requirement must be shown by actual demonstration using the test criteria outlined in Appendix J of Chapter 525 of the AWM, unless the Minister finds that a combination of analysis and testing will provide data equivalent to that which would be obtained by actual demonstration.
- (2) The demonstrations test the following:
 - (a) the basic aeroplane design;
 - (b) the efficiency with which passengers and crew members can be safely evacuated from the aeroplane;
 - (c) the aeroplane's emergency evacuation systems; and
 - (d) the applicant's emergency evacuation procedures.
- (3) The TCCA National Aircraft Certification Branch has primary responsibility for the regulatory requirements in Part V of the CARs that relate to planning, conducting, and evaluating an applicant's emergency evacuation demonstration.
- (4) While the National Aircraft Certification Branch is primarily responsible for evacuation demonstrations conducted by manufacturers in accordance with paragraph 525.803(c) of the

AWM, coordination with Airline Standards (Cabin Safety) is necessary to ensure compliance with operational requirements. This coordination is accomplished as follows:

- (a) Airline Standards (Cabin Safety) will review the applicant's plan for compliance with operational regulations. Airline Standards (Cabin Safety) and the National Aircraft Certification Branch, Occupant Safety Section must concur on the acceptability of the applicant's plan.
 - (b) National Aircraft Certification (Occupant Safety) and Airline Standards (Cabin Safety) personnel shall observe the actual demonstration.
- (5) In the absence of Canadian purchasers for an aeroplane, crew members used in an applicant's evacuation demonstration should be trained in a program similar to the emergency evacuation portion of training programs approved under subparagraph 705.124(2)(b)(iv) of the CARs. Such a training program may be required to form the basis of emergency procedures training for operators of that aeroplane model.

3.5 Maximum demonstrated seating capacity

- (1) The maximum number of passenger seats for specific transport category aeroplane models is specified in the type certificate data sheet or, for certain modifications, in a supplemental type certificate. These documents should be consulted to determine the official maximum certified occupancy for an aeroplane.

3.6 Establishing seating capacity by analyses and tests

- (1) A combination of analyses and tests may be used to show that an aeroplane is capable of being evacuated within 90 seconds under the conditions specified in paragraph 525.803(c) of the AWM. If the Minister finds that a combination of analyses and tests will provide sufficient data on the emergency evacuation capability of the aeroplane, and the data is equivalent to what would be obtained by actual demonstration, then an actual demonstration may not need to be conducted.
- (2) A request for an increase in seating capacity shall not be approved without the analysis and test data being evaluated by the National Aircraft Certification Branch. Any request for an increase in seating capacity by the analysis and test data method should also be forwarded to Airline Standards (Cabin Safety).
- (3) Increases in passenger seating capacity beyond the maximum exit capacity of the aeroplane should not be permitted under any circumstance.

4.0 Demonstration of emergency evacuation procedures

4.1 General

- (1) A demonstration of emergency evacuation procedures involves any scenario where the aeroplane remains in the normal ground attitude with landing gear extended. Typically, the scenario simulates a rejected takeoff and is the most commonly performed type of demonstration. All operators should expect to conduct this demonstration for each aeroplane model configured to carry 44 or more passengers.
- (2) During the demonstration the following areas are evaluated:
- (a) the operator's emergency training program;
 - (b) crew member competency;
 - (c) the operator's emergency evacuation procedures; and

- (d) the serviceability of the emergency equipment on the aeroplane.
- (3) Section 604.224 of the CARs specifies the criteria used for evaluating a demonstration of emergency evacuation procedures.
- (4) The operator shall demonstrate the effectiveness of its crew member emergency training and evacuation procedures by accomplishing the following:
 - (a) conducting a demonstration without passenger participants using the operator's emergency evacuation procedures;
 - (b) opening the selected exits and deploying the escape slides, if applicable, so that the exits and escape slides are ready for use within 15 seconds;
 - (c) using flight attendants who have completed the operator's training program for the model of aeroplane being demonstrated;
 - (d) opening 50% of the required floor-level emergency exits;
 - (e) opening 50% of the required non-floor-level emergency exits if operator developed procedures require flight attendants to open those exits; and
 - (f) deploying 50% of the escape slides, if applicable.

Note: Failure to open all exits selected, or opening an exit not selected, will constitute a failure of the demonstration.
- (5) The following information should be considered when determining if an exit is ready for use.
 - (a) Floor-level exits with escape slides are considered to be ready for use when the exit is fully opened and the escape slides are completely deployed or inflated and properly positioned in a manner which would not impede passenger or crew member egress. The inflation cylinder may still be making a hissing sound and the escape slide may not actually touch the ground until the first passenger uses the escape slide. Neither one of these situations would prevent the escape slide from being ready for use.
 - (b) Floor-level exits with stairs are considered to be ready for use when the exit is fully opened, the stairs are fully extended, and the bottom of the stairs is within six inches of the ground.
 - (c) Exits not equipped with a means of escape present some different considerations when determining ready for use. In this case, the operator will refer to their procedures to determine when the exit is ready for use. For example, in the case of a non-floor-level emergency exit, the crew member shall remove and place the hatch in accordance with the operator's procedures. In the case of a floor-level plug/hatch on some smaller aeroplanes, this might mean that the hatch falls out of the aeroplane and lands directly under the door sill.

4.2 Determine the need for a demonstration of emergency evacuation procedures

- (1) An operator shall conduct a demonstration of emergency evacuation procedures in the following situations.
 - (a) When introducing a new model of aeroplane into its fleet for the purpose of carrying passengers.
 - (b) When introducing an aeroplane into its fleet and there is a difference in any of the following items between the new aeroplane and other aeroplanes of the same model that are already in the fleet:
 - (i) The location of the flight attendants — when an operator proposes to change a flight attendant seating assignment for any reason, they must consider if that

action changes the flight attendant's evacuation duties or procedures. For example, changing a flight attendant seating assignment from one floor-level exit to an adjacent floor-level exit may not constitute a change in flight attendant duties. However, if an operator changes the seating location because of a new procedure that requires, for the first time, flight attendants to open a non-floor-level emergency exit, that action would constitute a significant change and would require a demonstration of emergency evacuation procedures.

- (ii) The evacuation duties or procedures of flight attendants — when an operator proposes to change emergency evacuation duties or procedures, the operator must consider the scope and character of the change in determining the requirement for a demonstration of emergency evacuation procedures. If the degree of change is significant and requires flight attendant actions or knowledge that has never been previously required or demonstrated, a demonstration of emergency evacuation procedures is required. For example, if a flight attendant will now be required to open two floor-level exits instead of one, or if a flight attendant position has a new exit responsibility at a non-floor-level emergency exit. If the change in duties or procedures is minor or can adequately be dealt with through the operator's training program, a demonstration may not be required. Generally, changes in flight attendant evacuation duties constitute a significant change and require a demonstration of emergency evacuation procedures.
- (iii) The number, location or type of emergency exits or the number, location or type of opening mechanisms for the emergency exits
 - (A) A change in the number of floor-level emergency exits generally results in a change in the minimum number of flight attendants and will require a demonstration of emergency evacuation procedures. For example, the Boeing 767-300 model of aeroplane has three different floor-level emergency exit configurations: two pairs of Type A (for a total of four exits); three pairs of Type A (for a total of six exits); and three pairs of Type A and one pair of Type I (for a total of eight exits). However, a change in the number of non-floor-level emergency exits is usually not a significant change, especially if the exits are all the same type as the other exits and are located in the same area. For example, if the new model of aeroplane has two pairs of non-floor-level emergency exits instead of one pair, this would not be a significant change if all the exits are of the same type and operate in the same way.
 - (B) A change in the location of exits could be a significant change, but often is not. If the exits are the same identical type and the only change in location is several feet, this might not be a significant change.
 - (C) Evaluation of training and procedures is one of the reasons for conducting a demonstration of emergency evacuation procedures. A change in the opening mechanism of an exit is a significant change and a demonstration should be conducted so that TCCA may assess training on the new opening mechanism. For example, door 2L (aft port exit) on some Boeing 737-200 models are equipped with a standard rotary opening mechanism while other Boeing 737-200 models configured for combination freight and passenger operations are equipped with integrated airstairs that incorporate a completely different design, control mechanism, operating procedures, and means of evacuation.
- (c) Reconfiguring a model of aeroplane may involve adding or removing seats and the reconfiguration may change the minimum number of flight attendants required on each

deck of an aeroplane model operating under the ratio set out in section 604.221 of the CARs.

- (i) A change in the minimum number of required flight attendants requires a demonstration of emergency evacuation procedures. The need for an evacuation demonstration is based on a change in the number of required flight attendants that were used in the former evacuation demonstration for that model of aeroplane by that operator.
 - (ii) A change in passenger seating configuration that does not result in a change to the minimum number of required flight attendants usually does not require the conduct of a demonstration. Of course, the conditions stipulated in subsections 604.223(2) and (3) must be considered.
 - (iii) In addition, if there is a reduction in the passenger seating configuration but the operator does not wish to operate the aeroplane with a reduced number of flight attendants, a demonstration is not required.
 - (iv) However, in some cases where the flight attendant duties or procedures change significantly, a change in the seating configuration that does not result in the addition or reduction of flight attendants may require a demonstration (e.g., the installation of a main deck Class B, C or F cargo compartment resulting in a combi (passenger/cargo) configuration).
- (2) Where an operator has previously carried out a successful demonstration of its emergency evacuation procedures for another model of aeroplane in its fleet, it may be able to use that result in lieu of conducting a new demonstration.
- (a) To provide for an acceptable level of safety, an operator must have first carried out a successful demonstration of its emergency evacuation procedures for a model of aeroplane in accordance with sections 604.223 and 604.224. Successful completion of a demonstration of emergency evacuation procedures shows that at the time of the demonstration, the operator's procedures, training, and equipment, with respect to emergency evacuations, were functional and effective for that model of aeroplane.
 - (b) The operator may then use this successful demonstration to conduct an analysis of this model of aeroplane, compare it with the new model of aeroplane, and verify there is no difference in any of the items specified in subsection 604.223(1.1).
 - (c) Once a successful demonstration has been conducted by the operator, a subsequent demonstration is only required if:
 - (i) there is a difference in the number, location, or emergency evacuation duties or procedures of flight attendants who are required by section 604.221; or
 - (ii) there is a difference in the number, location, type of emergency exits, or type of opening mechanism on emergency exits available for evacuation.
- Note:** Non-floor-level emergency exits are only included in this analysis if their opening is an assigned flight attendant emergency evacuation duty in the operator's manual.
- (d) Any of these differences that exist between the two models of aeroplane will require that the operator conduct a demonstration of its emergency evacuation procedures on the new model.

4.3 The operator's demonstration plan

- (1) The operator's plan shall contain the following information:

- (a) the applicable regulation that requires that a demonstration of emergency evacuation procedures be conducted;
 - (b) the aeroplane model and the full seating configuration (including crew members) to be demonstrated by the operator;
Note: The maximum certified seating capacity is contained in the type certificate data sheet.
 - (c) the number of flight attendants and their duty assignment positions to be used during the demonstration;
 - (d) the proposed date, time, and location of the demonstration;
 - (e) the name and contact information of the operator's evacuation demonstration coordinator;
 - (f) a description of how the operator will establish participant safety including provisions for safety personnel, stands, ramps, padding, and ambulance coordination, as applicable;
 - (g) a description of how the operator proposes to initiate the demonstration (see section 4.7 of this AC);
 - (h) a description of the signal to be used for the purpose of timing;
 - (i) a description of how the operator proposes to abort the demonstration in the event a safety hazard develops, such as using a hand-held compressed gas horn as a signal to terminate the demonstration (previous experience has shown that a whistle blast may not be adequate);
 - (j) a description of how the operator proposes to block exits (see section 4.6 of this AC);
 - (k) a description of the emergency equipment installed on the aeroplane, including the type and model of each item, as applicable; and
 - (l) a list of crew members (both flight deck and flight attendant) qualified to participate in the demonstration. The operator should present a minimum of two complete crews for the demonstration. If a specific list of crew members is not available, a description of how the operator will ensure conditions required for the selection of crew members (both flight deck and flight attendant) will be met (see section 4.8(5) of this AC).
- (2) A diagram or LOPA shall be included in the plan, representing the aeroplane model to be demonstrated. The diagram shall show the following:
- (a) the location and designation of all exits by type and the designated exit pairs;
 - (b) the assigned seating location of each required crew member during takeoff;
 - (c) the interior cabin configuration, showing the location of individual passenger seats, galleys, aisles, lavatories, and passenger compartment partitions and bulkheads; and
 - (d) the location and type of safety and emergency equipment on the aeroplane, including:
 - (i) first aid kit(s);
 - (ii) megaphone(s);
 - (iii) emergency locator transmitter (over water);
 - (iv) crash axe;
 - (v) life preservers and individual flotation devices;
 - (vi) flashlights;
 - (vii) hand-held fire extinguishers;

- (viii) protective breathing equipment;
 - (ix) portable oxygen bottles/masks;
 - (x) life rafts, slide rafts, emergency stairs;
 - (xi) survival kits – land (if applicable);
 - (xii) survival kits (over water).
- (3) The plan shall contain copies of the following documents:
- (a) the appropriate crew member manual pages describing emergency evacuation duties and responsibilities;
 - (b) a copy of the safety features card that will be used on the aeroplane during passenger-carrying operations; and
 - (c) a copy of the operator's proposed briefing text to be used in the crew member pre-demonstration briefing. It is recommended that this be in the form of a script that describes the key objectives of the demonstration and includes those elements outlined in section 4.10 of this AC.
- (4) The plan should include a description of how the operator will ensure the demonstration is conducted with exterior ambient light levels of no greater than 0.3 foot-candles prior to the activation of the aeroplane emergency lighting system.
- (a) This level of illumination is approximately the level that is found in the passenger cabin when the emergency lighting system is the only source of illumination. Allowing this low level lighting outside the aeroplane will enhance the ability of the demonstration coordinator to see and react more quickly to problems that may develop during the demonstration and 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.
 - (b) Although section 604.224 of the CARs stipulates criteria for carrying out a demonstration of emergency evacuation procedures, it does not specifically establish exterior ambient light levels. It is TCCA policy that the ambient light levels specified in Appendix J, paragraph (a) of Chapter 525 of the AWM are required for evaluating the aeroplane's emergency lighting system and the performance of the crew members in a darkened environment.
 - (c) The most effective way of controlling the level of illumination is to conduct the demonstration in a darkened hangar. The use of window shades in the down or partially lowered position could also be effective in achieving the objective of controlling the ambient light levels 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 exercise. Additionally, window shades in the down or partially lowered position could maintain flight attendant concentration inside the aeroplane and be prevented from observing pre-demonstration activities occurring outside the aeroplane.
 - (d) The use of window shades in the down or partially lowered position should not conflict with established operator procedures on the position of window shades for the demonstration exercise. For example, if there are no windows at the exit and the operator has established a procedure of having window shades in the open or up position for takeoff and landing because that cabin configuration is needed to provide a means for

flight attendant assessment duties, the demonstration exercise should replicate that cabin configuration.

- (5) The plan shall include a description of how the operator will ensure that the aeroplane is positioned in a location, either indoors or outdoors, which will allow the unobstructed deployment of all emergency stairs or escape slides, as applicable.
- (6) The plan should indicate that observers will be stationed inside the aeroplane at expected critical locations, and outside the aeroplane at each exit to be used.

4.4 Use of time-encoded video recording

- (1) The operator shall provide interior and exterior video coverage to record activities at all exits in accordance with subsection 604.224(3) of the CARs.
- (2) Thorough interior and exterior video documentation may be beneficial for acquiring data, explaining anomalies, or identifying causes of failed demonstrations.
- (3) Interior and exterior placement of video cameras should not indicate which exits are to be used in the demonstration. This may require installation of cameras at all exits.

4.5 Identification of exits to be used

- (1) This demonstration requires opening 50% of the floor-level emergency exits. In addition, 50% of the non-floor-level emergency exits must be opened if this is an assigned flight attendant emergency evacuation duty in the operator's manual.
- (2) The exits to be used shall be representative of all floor-level emergency exits on the aeroplane. Any emergency exit assigned to a flight attendant as part of his or her evacuation duties may be selected for use during the evacuation demonstration.
- (3) The exits that are selected do not have to be part of an exit pair. For demonstrations conducted by the aeroplane manufacturer, one exit from each exit pair is selected. While this is also an acceptable method for the operator demonstration, other exit combination possibilities exist and may be selected. For example, if an aeroplane is configured with four flight attendant seats adjacent to the four floor-level exits, it would be permissible to have one exit pair blocked and the other exit pair be demonstrated. This type of combination would meet the requirement of opening 50% of the exits.
- (4) Where one flight attendant is assigned to open more than one floor-level exit, this exit assignment may be tested in the demonstration to verify that it is realistic and can be practicably accomplished. The operator may select both exits within an exit pair to be opened or blocked in order to evaluate the ability of the flight attendant to open and manage both exits.

4.6 Methods of blocking exits

- (1) The selected method for blocking of exits shall require flight attendants to assess the exits.
- (2) The following are examples of acceptable methods of blocking exits during a demonstration of emergency evacuation procedures:
 - (a) Mechanical methods of exit deactivation that are not perceptible to a crew member prior to attempting to operate the exit may be used. The operator should ensure that the deactivation means can withstand the high forces that may be applied by a crew member, since inadvertent opening of a deactivated exit will likely invalidate the demonstration.
 - (b) To simulate a fire at blocked exits, secure a chemical luminary/cyalume stick (glow stick) to the exterior of each exit so that it is visible to the flight attendant assessing the exit.

Secure a line to the glow stick long enough to reach the ramp or hangar floor. At the initiation signal, designated operator employees will pull lines attached to the glow sticks to remove them from the exits that are to be used and leave the glow sticks on the exits that are not to be used.

- (c) Cover the window at each exit with a swatch of red cloth. Secure a line to the cloth long enough to reach the ramp or hangar floor. At the initiation signal, designated operator employees will pull the lines to uncover the windows of exits that are to be used. Windows of exits that are not to be used will remain covered.
- (d) Secure red lights to the exterior of each exit so that when illuminated, they are visible to the flight attendant assessing the exit. At the initiation signal, the lights at exits that are not to be used will be illuminated by a designated operator employee to simulate fire at blocked exits. The lights shall be illuminated simultaneously with the initiation of the emergency demonstration. Early illumination of the blocking signal will invalidate the demonstration.
- (e) Position a flashlight on the exterior of each exit so that when it is illuminated, it is visible to the flight attendant assessing the exit. At the initiation signal, designated operator employees will illuminate the flashlights to simulate fire at the exits that are not to be used.

Note: Any failure of a blocking signal to function as described in the plan that would result in providing an early indication to the flight attendant(s) of the exits selected to be used will invalidate the demonstration.

- (3) Once a method of blocking exits has been selected, the operator's evacuation demonstration coordinator will ensure the provision of the required maintenance and logistical support to prepare the exit blocking methods.
- (4) The flight attendants should see the blocking signal on the aeroplane in the same ambient conditions that will be present during the demonstration. This could be in addition to a video, a photo, or a demonstration of the signal in a briefing room. It is important that the flight attendants have the opportunity to see exactly what they will be seeing on the aeroplane during the evacuation demonstration. While it is permissible for flight attendants to assess their exits for familiarity with the blocking signal, this should be accomplished prior to the commencement of the demonstration activity.

4.7 Initiation signal and timing

- (1) Timing the emergency evacuation demonstration is very important. The timing should start on a prearranged signal. It is essential that all participants be aware of the demonstration initiation signal.
- (2) The operator should propose a method that provides the same initiation signal for participants and personnel inside and outside the aeroplane. The signal has to be given to both cabin and ground personnel simultaneously to initiate the demonstration.
- (3) The preferred method of initiation is for an operator employee to interrupt the aeroplane's normal source of power by:
 - (a) disconnecting or turning off an external source of power or a ground power unit;
 - (b) disconnecting or turning off the auxiliary power unit; or
 - (c) interrupting power from the flight deck.
- (4) These actions provide a clear initiation signal in the following ways.

- (a) Inside the aeroplane, the flight attendants and operator observer(s) will see the normal cabin lighting go out followed by the emergency lighting system coming on. This is the signal for the flight attendants to commence the evacuation demonstration. It should be noted that these are not simultaneous events and there could be a second or two delay between the cabin lights going out and the emergency lighting system coming on. For timing purposes, the demonstration commences when the cabin lights go out.
 - (b) Outside the aeroplane, operator observers (stationed at each exit) will see the external lights (for example, taxi lights, anti-collision lights, position lights, and logo lights) go out. This is the signal to start the timing and make other necessary observation actions.
- (5) For the demonstration of emergency evacuation procedures, an audible signal terminating the demonstration is issued after 15 seconds. This audible signal should also be recorded on the time-encoded video required by subsection 604.224(3) of the CARs.
- (a) For this demonstration, there should be one member who is responsible for the 15 second time limit. This person will sound the signal to end the demonstration; the signal is also used by the exit observers when determining if the exit is ready for use.
 - (b) Although not required, where individual exit preparation time is also being recorded to obtain additional data, the timing stops when the designated exit has been opened and the exit, as well as any egress assist means, is ready for use.
- (6) The use of redundant timing methods is encouraged, such as two stopwatches (a primary and a backup). While a stopwatch provides instantaneous feedback during the demonstration, it can be difficult to use at the beginning of the demonstration where the ambient environment will be dark. The use of backlit stopwatches or other visual verification means is recommended.

4.8 Participants

- (1) Due to the complexity involved in conducting a demonstration of emergency evacuation procedures, only those individuals who have a genuine need or concern should be present during the demonstration. Nonessential personnel may present hazards or affect the outcome of the demonstration.
- (2) Operator officials
- (a) Operator officials, such as directors of operations and maintenance, must be available at the demonstration site.
 - (b) The operator officials present must have the authority to modify the demonstration plan on site.
 - (c) They must be able to respond to requirements for specific corrective actions to address deficiencies that occur during the demonstration.
 - (d) Other operator personnel present at the demonstration site should have a direct role in the conduct of the demonstration. The operator should be informed that, although nonessential operator personnel may observe the demonstration, it is the operator's responsibility to ensure that these persons do not pose a distraction or affect the demonstration's outcome.
- (3) Safety personnel
- (a) The operator should station safety personnel outside the aeroplane to protect participants.
 - (b) Safety personnel may not provide any assistance to crewmembers or intervene in any manner that contributes to the efficiency of the demonstration. Safety personnel are used

only to ensure participants are not injured from accidents such as slipping off wings or falling from exits.

Note: If it is determined that intervention by safety personnel accelerated completion of the demonstration, this may invalidate the demonstration.

- (4) Non-operator personnel
 - (a) Non-operator personnel who are not Transport Canada personnel must have specific reasons to observe the demonstration. Usually, these individuals will be representatives of the aeroplane manufacturer, manufacturers of equipment used during the demonstration, or other organizations with a direct interest in aviation safety.
 - (b) The operator is responsible for all non-Transport Canada personnel observing the demonstration. Those not directly involved in the demonstration should be kept at a reasonable distance from the aeroplane by some means such as ropes or lines.
- (5) Crew members
 - (a) The qualifications of the crew members used in the demonstration should be consistent with qualifications of line crew members. Normally, crew members used in these demonstrations should have been line crew members for the last two years. In addition, whenever possible, crew members should not have taken part in this type of demonstration within the preceding six months. However, there are smaller operators where this may not be possible. In such a case, the operator should document and include the former experience in the demonstration report.
 - (i) Flight crew members
 - (A) The flight crew members shall be qualified in the aeroplane to be used. However, they need not have completed the pilot proficiency check, line check or line indoctrination training.
 - (B) The flight crew members shall take no active role in assisting others inside the cabin during the demonstration.
 - (C) Where the flight crew members have no direct involvement in the evacuation demonstration, beyond their flight deck duties, the same flight crew members may be used for multiple demonstrations (e.g., the two flight crew members that participated in the demonstration of emergency evacuation procedures may also be used in the ditching demonstration).
 - (ii) Flight attendants
 - (A) Flight attendants shall have completed the operator's training program for the model of aeroplane being demonstrated and should have successfully completed a written or practical examination on the model of aeroplane, emergency equipment, and procedures.
 - (B) Flight attendants shall not be provided additional emergency training or emergency equipment familiarization beyond what is specified in the operator's training program before the demonstration.
 - (C) The operator should not allow flight attendants who have been allowed to practice opening doors/exits to be used in the evacuation demonstration unless the operator's training program includes this additional training. Practice is any training conducted outside of the normally scheduled training programs.
 - (D) The flight attendant complement shall consist of the minimum number of flight attendants that the operator proposes to use on the aeroplane

during operations, and in no case shall the minimum be less than that specified in section 604.221 of the CARs.

- (b) The following individuals should not be selected:
 - (i) persons used in previous demonstrations within the last six months;
 - (ii) emergency procedures instructors;
 - (iii) supervisors;
 - (iv) check pilots;
 - (v) union safety representatives; or
 - (vi) others that may have an above average level of competency or experience, such as training or other management personnel.
- (c) The operator should select a minimum of two complete crews for the demonstration(s). In the event of multiple demonstration failures, the lack of trained crew members for future demonstrations should be considered. It is possible that in the case of equipment failures unrelated to operator training or procedures, such as an escape slide that failed to inflate due to equipment malfunction, the same crew members can be used to test the equipment. This determination should be documented by the operator.
- (d) It is very important that back-up crew members who may be used if the first demonstration fails are not given any information about the first demonstration. Sometimes, this is best accomplished by having these crew members isolated in an area that is physically removed from the demonstration area. If the back-up crew members are not held in an area away from the demonstration, they should stay in a group in a location that will ensure they are not given any information about the first demonstration.
- (e) When an operator is new, typical line crew members may not be available. When this is the case, the operator must train the first cadre of flight attendants; it is quite possible that these flight attendants will also be instructors. Nevertheless, they should not be given instruction or experience that will not be given to trainees expected to serve as flight attendants on this aeroplane. For example, they should not have had train the trainer training until after their participation in the evacuation demonstration. Flight attendant managers or their delegates who are in charge of the operator's flight attendant programs should not be used as crew members during the demonstration, unless no other flight attendants have been hired.
- (f) Transport Canada encourages, whenever possible, the use of separate crew members for the emergency evacuation demonstration and the ditching demonstration. Some operators may not be aware of the stress level the crew members face by participating in these types of demonstrations. Additionally, by providing separate crew members for each demonstration, it provides the operator with a better assessment of the training program. In the event of a non-flight attendant demonstration failure (e.g., equipment failure), it is recommended that a new flight attendant crew be selected from the remaining flight attendant group.

4.9 Pre-demonstration inspection

- (1) Prior to the conduct of the demonstration, the operator shall ensure the following:
 - (a) The aeroplane is configured and equipped for takeoff according to the operator's manuals and procedures.
 - (b) The aeroplane includes the operator's proposed full passenger seating configuration.
 - (c) All appropriate emergency equipment is installed.

- (d) The ambient light levels specified in Appendix J, paragraph (a) of Chapter 525 of the AWM are established in order to evaluate the following:
 - (i) the aeroplane's emergency lighting system; and
 - (ii) crew member performance in darkened conditions.
- (e) The following personnel are present:
 - (i) safety personnel to prevent participant injury;
 - (ii) operator personnel with the authority to direct demonstration modifications; and
 - (iii) the minimum number of proposed flight attendants for use on the aeroplane during airline operations per section 604.221 of the CARs.
- (2) For the demonstration of emergency evacuation procedures, the escape slides used may be beyond their scheduled inspection criteria. The operator shall identify this option in the demonstration plan. The plan shall state that the operator accepts full responsibility for any failure of the demonstration due to a malfunction of the escape slides.

4.10 Pre-demonstration briefing

- (1) On the day of the demonstration, the operator's evacuation demonstration coordinator should provide crew members with the specific briefing information in the demonstration plan, including the key objectives and aspects of the demonstration and a clear understanding of the artificial nature of the demonstration.
- (2) The operator's demonstration coordinator should discuss the following items.
 - (a) The purpose of the demonstration is to evaluate:
 - (i) the effectiveness of the training program as reflected by the crew members' actions;
 - (ii) the adequacy of the emergency procedures; and
 - (iii) the serviceability of the aeroplane emergency equipment.
 - (b) The initiation signal that begins the demonstration shall be clearly specified.
 - (c) Ensure the crew members are briefed and aware of the blocking signals. It is recommended that the crew members see the exit blocked signal on the aeroplane in the same ambient conditions that will be present during the emergency evacuation demonstration. The blocking signal shall be clear, specific, unambiguous, and placed in the same location and position as during the evacuation demonstration. While it is permissible for flight attendants to assess their exits for familiarity with the blocking signal, this should be accomplished prior to the commencement of the demonstration activity.
 - (d) The significance of the 15-second time limit for the demonstration of emergency evacuation procedures and the need to complete all actions efficiently and effectively within the allotted time.
 - (e) The signal to be used for stopping the demonstration such as a hand-held compressed gas horn, or some other clear audible means should be described. Ensure that the crew members understand that any evacuation activity in progress shall immediately cease with a stop signal.
 - (f) Safety during the demonstration, crew member responsibilities and safety personnel duties and limitations should be emphasized.

4.11 Use of personal communication devices

- (1) The operator should consider limiting or restricting the use of personal communication devices, including cellular telephones and smartphones, prior to and during the conduct of the demonstration(s), to limit information sharing among participants prior to the completion of the demonstration.

4.12 Conducting the demonstration

- (1) The operator's evacuation demonstration coordinator shall ensure all pre-demonstration briefings and inspections are completed before the actual demonstration.
- (2) The following sequence of events represents an acceptable means, derived from experience, for conducting the demonstration.
- (3) The flight attendants shall accomplish the following:
 - (a) prepare for a normal departure according to the operator's procedures, including closing and securing all exits and galleys, and arming the emergency evacuation system for takeoff;
 - (b) conduct a passenger briefing in accordance with section 604.85 of the CARs and operator procedures;
 - (c) sit at their assigned positions with their restraint systems fastened; and
 - (d) conduct silent review.
- (4) Each external door and exit and each internal door or curtain should be in position for a normal takeoff.

Note: Once the crew members have boarded and the exterior doors have been closed, the operator's evacuation demonstration coordinator will then advise the designated operator employee(s) responsible for the exit blocking signal(s) to take their position.

- (5) The flight crew members should simulate preparing for takeoff, including the accomplishment of all appropriate checklist tasks, and ensure that the aeroplane is configured for a normal takeoff before the initiation signal is given.
- (6) After completing all required pre-takeoff actions, the pilot-in-command shall inform a designated operator employee that the aeroplane is ready for takeoff. The operator employee shall then inform the operator's evacuation demonstration coordinator that the aeroplane and crew members are ready to conduct the demonstration.
- (7) The operator's evacuation demonstration coordinator shall ensure that all observers and operator safety personnel are ready and in position.
- (8) The operator's evacuation demonstration coordinator may issue a warning signal (distinct and different from the terminating signal), which should precede the initiation signal by approximately 30 seconds.
- (9) The operator's evacuation demonstration coordinator shall initiate the demonstration using the method described in the demonstration plan.
- (10) The timing will begin when the external aeroplane lights go out.
- (11) At 15 seconds, the operator's evacuation demonstration coordinator shall issue a clear, audible signal terminating the demonstration.
- (12) Each observer assigned to an exit selected for use will determine if the assigned exit was opened and each escape slide was ready for use before the termination signal is heard. Any exit or

escape slide that remains not ready for use after the termination signal is heard will constitute an unsatisfactory demonstration.

- (13) The operator may choose to conduct post-demonstration interviews with participants in order to obtain additional information or clarification regarding the demonstration. Appendix B contains sample interview questions.

5.0 Demonstration of emergency evacuation procedures – ditching

5.1 General

- (1) In aviation, ditching is a planned event where the flight crew members and flight attendants have sufficient time to fully prepare the aeroplane and the passengers, and is distinct from an unplanned water landing or inadvertent water contact where the flight crew members and flight attendants are not able to prepare the aircraft or passengers and no actions are taken to improve the flotation characteristics of the aeroplane (e.g., close outflow valves).
- (2) The demonstration simulates a planned ditching and evaluates the operator's ability to prepare passengers, the aeroplane, and the ditching equipment. The preparation for ditching is similar in nature to the preparation for a planned evacuation.
- (3) During the demonstration the following areas are evaluated:
 - (a) the operator's emergency training program;
 - (b) crew member competency;
 - (c) the operator's ditching procedures; and
 - (d) the serviceability of the emergency equipment on the aeroplane.
- (4) Section 604.225 of the CARs requires an operator to conduct a ditching demonstration for each model of aeroplane used in extended over-water operations and that is required to have equipment for survival under section 602.63 of the CARs. The ditching demonstration is conducted in accordance with the requirements specified in section 604.226 of the CARs and the guidance provided in this document.
- (5) While it is recommended that the operator use an aeroplane for all ditching demonstrations, it is permitted to use a life-sized mock-up of that model of aeroplane or a floating device.
- (6) Where the use of a life raft is to be demonstrated, stands should be in place at each emergency exit or wing that will be used for the demonstration. During type certification, ditching emergency exits must be shown to be above the calculated water level that would exist if the aeroplane was at rest in the water. The operator should obtain water level and ditching exit information from the aeroplane manufacturer. The top of the stand should be positioned at the calculated water level.
- (7) The regulations do not specify a maximum time limit for the demonstration. However, it is imperative that emergency equipment, crew member competency, and emergency procedures provide for as rapid an evacuation as during an actual ditching.
 - (a) During the demonstration, emphasis is on crew member ability and efficiency in the time period between the decision to ditch and the actual water landing.
 - (b) Fifteen minutes is considered a realistic time acceptable for ditching preparation, beginning with the ditching announcement to the point of simulated water landing. However, the amount of time a crew is given to prepare the cabin for a ditching demonstration should be reasonable and based on the operator's procedures.
 - (c) The flight attendants should be performing duties associated with normal flight, such as serving meals with the cart in the aisle, when the signal to ditch is given.

- (d) The timing should start when the pilot-in-command notifies the flight attendants of the impending ditching. The crew members shall use the operator's procedures as outlined in the appropriate manuals. The timing stops when the flight attendants have completed preparations and notify the pilot-in-command that the cabin is prepared.
- (8) After the simulated water landing, any life rafts stored inside the aeroplane will be removed from storage. While this action is not specifically timed, the crew members must demonstrate competency in obtaining the life rafts and preparing them for deployment in a reasonable amount of time.
- (9) A secondary, potentially critical issue in an actual ditching is the time it takes to open the exit(s). Exits cannot be opened once an internal pressure has reached a given threshold. It is possible, in worst case ditching scenarios, that the internal pressure rise from water ingress could result in an inability to open exits. Excessively long preparation procedures before emergency exits are opened should be avoided. The aeroplane manufacturer should be able to provide data on the maximum time allowable before exit opening begins.

5.2 Determine the need for a ditching demonstration

- (1) A ditching demonstration is required when the operator proposes to operate a model of aeroplane to carry passengers in extended over-water operations and the aeroplane is required to have survival equipment under section 602.63 of the CARs.
- (2) The demonstration shall be carried out before starting the extended over-water operations.

5.3 The operator's demonstration plan

- (1) If the operator plans to conduct the ditching demonstration in conjunction with an emergency evacuation demonstration, the operator's demonstration plan shall include the following additional information.
 - (a) Copies of the operator's manual relating to crew members' ditching duties and responsibilities, including cabin preparation time parameters for both planned ditching and inadvertent water contact.
 - (b) A description of applicable emergency equipment used for ditching, including the type and model.
- (2) The operator's plan shall contain the following information:
 - (a) the applicable regulation that requires that a ditching demonstration be conducted;
 - (b) the aeroplane model and the full seating configuration (including crew members) to be demonstrated by the operator;
Note: The maximum certified seating capacity is contained in the type certificate data sheet.
 - (c) the number of flight attendants and their duty assignment positions to be used during the demonstration;
 - (d) the proposed date, time, and location of the ditching demonstration;
 - (e) the name and contact information of the operator's ditching demonstration coordinator;
 - (f) a description of how the operator will establish participant safety including provisions for safety personnel, stands, ramps, padding, and ambulance coordination, as applicable;
 - (g) a description of how the operator proposes to initiate the demonstration;

- (h) a description of how the operator proposes to abort the demonstration in the event a safety hazard develops, such as using a hand-held compressed gas horn as a signal to terminate the demonstration (previous experience has shown that a whistle blast may not be adequate);
 - (i) a description of the ditching equipment installed on the aeroplane, including the type and model of each item, as applicable; and
 - (j) a list of crew members (both flight deck and flight attendant) qualified to participate in the demonstration. The operator should select a minimum of two complete crews for the demonstration. If a specific list of crew members is not available, a description of how the operator will ensure conditions required for the selection of crew members (both flight deck and flight attendant) will be met (see section 5.5(6) of this AC).
- (3) A diagram or LOPA shall be included in the plan, representing the aeroplane model to be demonstrated. The diagram shall show the following:
- (a) the location and designation of all exits by type, the designated exit pairs, and the designated ditching emergency exits;
 - (b) the assigned seating location of each required crew member during a ditching;
 - (c) the interior cabin configuration, showing the location of individual passenger seats, galleys, aisles, lavatories, and passenger compartment partitions and bulkheads; and
 - (d) the location of emergency ditching equipment, including:
 - (i) life rafts and/or slide rafts;
 - (ii) emergency locator transmitter;
 - (iii) survival kits; and
 - (iv) life preservers.
- (4) The plan shall contain copies of the following documents:
- (a) the appropriate crew member manual pages describing ditching duties and responsibilities;
 - (b) a copy of the safety features card that will be used on the aeroplane during passenger-carrying operations; and
 - (c) a copy of the operator's proposed briefing text to be used in the crew member and ABP pre-demonstration briefings. It is recommended that this be in the form of a script that describes the key objectives of the demonstration and includes those elements outlined in section 5.7 of this AC.
- (5) The plan shall include a description of how the operator will ensure that the aeroplane, mock-up of the aeroplane or floating device simulating a passenger compartment is positioned in a location, either indoors or outdoors, which will allow the unobstructed deployment of the life raft and/or slide raft.
- (6) The plan should indicate that observers will be stationed inside the aeroplane at expected critical locations, and outside the aeroplane at each exit to be used.

5.4 Use of time-encoded video recording

- (1) The operator shall provide interior and exterior video coverage to record activities at all exits in accordance with subsection 604.226(3) of the CARs.
- (2) Thorough interior and exterior video documentation may be beneficial for acquiring data, explaining anomalies, or identifying causes of failed demonstrations.

5.5 Participants

- (1) Due to the complexity involved in conducting a ditching demonstration, only those individuals who have a genuine need or concern should be present during the demonstration. Nonessential personnel may present hazards or affect the outcome of the demonstration.
- (2) Able bodied passengers (ABP)
 - (a) When an operator's procedures include using ABPs to remove or launch life rafts, then the same number of persons who will act as ABPs shall be used in the demonstration.
 - (b) Crew members, mechanics, and other operator personnel who would have emergency equipment knowledge shall not be used. In addition, persons involved in the design or type certification of escape systems, development of emergency evacuation crew training, or those who have previously conducted evacuation demonstrations should not be used.
 - (c) The operator's ditching demonstration coordinator should ensure that ABPs are not given additional training. The ABPs should be briefed and should perform the duties stipulated in the appropriate crew member manuals.
 - (d) The operator should supply enough ABPs to ensure coverage if the first demonstration is not successful.
- (3) Operator officials
 - (a) Operator officials, such as directors of operations and maintenance, must be available at the demonstration site.
 - (b) The operator officials present must have the authority to modify the demonstration plan on site.
 - (c) They must be able to respond to requirements for specific corrective actions to address deficiencies that occur during the demonstration.
 - (d) Other operator personnel present at the demonstration site should have a direct role in the conduct of the demonstration. The operator should be informed that, although nonessential operator personnel may observe the demonstration, it is the operator's responsibility to ensure that these persons do not pose a distraction or affect the demonstration's outcome.
- (4) Safety personnel
 - (a) The operator should station safety personnel outside the aeroplane to protect participants.
 - (b) Safety personnel may not provide any assistance to crew members or intervene in any manner that contributes to the efficiency of the demonstration. Safety personnel are used only to ensure participants are not injured from accidents such as slipping off wings or falling from exits.

Note: If it is determined that intervention by safety personnel accelerated completion of the demonstration, this may invalidate the demonstration.
- (5) Non-operator personnel
 - (a) Non-operator personnel, who are not Transport Canada personnel must have specific reasons to observe the demonstration. Usually, these individuals will be representatives of the aeroplane manufacturer, manufacturers of equipment used during the demonstration, or other organizations with a direct interest in aviation safety.

- (b) The operator is responsible for all non-Transport Canada personnel observing the demonstration. Those not directly involved in the demonstration should be kept at a reasonable distance from the aeroplane by some means such as ropes or lines.
- (6) Crew members
- (a) The qualifications of the crew members used in the demonstration should be consistent with qualifications of line crew members. Normally, crew members used in these demonstrations should have been line crew members for the last two years. In addition, whenever possible, crew members should not have taken part in this type of demonstration within the preceding six months. However, there are smaller operators where this may not be possible. In such a case, the operator should document and include the former experience in the demonstration report.
 - (i) Flight crew members
 - (A) The flight crew members shall be qualified in the aeroplane to be used. However, they need not have completed the pilot proficiency check, line check or line indoctrination training.
 - (B) The flight crew members shall take no active role in assisting others inside the cabin during the demonstration.
 - (C) Where the flight crew members have no direct involvement in the ditching demonstration, beyond their flight deck duties, the same flight crew members may be used for multiple demonstrations (e.g., the two flight crew members that participated in the demonstration of emergency evacuation procedures may be used in the ditching demonstration).
 - (D) If the flight crew members have evacuation responsibilities in a ditching per the operator's procedures, then the same flight crew members shall not be used for multiple ditching demonstrations.
 - (ii) Flight attendants
 - (A) Flight attendants shall have completed the operator's training program for the model of aeroplane being demonstrated and should have successfully completed a written or practical examination on the model of aeroplane, emergency equipment, and procedures.
 - (B) Flight attendants shall not be provided additional emergency training or emergency equipment familiarization beyond what is specified in the operator's training program before the demonstration.
 - (C) The operator should not allow flight attendants who have been allowed to practice opening doors/exits to be used in the evacuation demonstration unless the operator's training program includes this additional training. Practice is any training conducted outside of normally scheduled training programs.
 - (D) The flight attendant complement shall consist of the minimum number of flight attendants that the operator proposes to use on the aeroplane during operations, and in no case shall the minimum be less than that specified in section 604.221 of the CARs.
 - (b) The operator should select a minimum of two complete crews for the demonstration(s). In the event of multiple demonstration failures, the lack of trained crew members for future demonstrations should be considered. It is possible that in the case of equipment failures unrelated to operator training or procedures, such as a raft that failed to inflate due to

equipment malfunction, the same crew members can be used to test the equipment. This determination should be documented by the operator.

- (c) It is very important that back-up crew members who may be used if the first demonstration fails are not given any information about the first demonstration. Sometimes, this is best accomplished by having these crew members isolated in an area that is physically removed from the demonstration area. If the back-up crew members are not held in an area away from the demonstration, they should stay in a group in a location that will ensure they are not given any information about the first demonstration.
- (d) When an operator is new, typical line crew members may not be available. When this is the case, the operator must train the first cadre of flight attendants; it is quite possible that these flight attendants will also be instructors. Nevertheless, they should not be given instruction or experience that will not be given to trainees expected to serve as flight attendants on this aeroplane. For example, they should not have had train the trainer training until after their participation in the evacuation demonstration. Flight attendant managers or their delegates who are in charge of the operator's flight attendant programs should not be used as crew members during the demonstration, unless no other flight attendants have been hired.
- (e) Transport Canada encourages, whenever possible, the use of separate crew members for the emergency evacuation demonstration and the ditching demonstration. Some operators may not be aware of the stress level the crew members face by participating in these types of demonstrations. Additionally, by providing separate crew members for each demonstration, it provides the operator with a better assessment of the training program. In the event of a non-flight attendant demonstration failure (e.g., equipment failure), it is recommended that a new flight attendant crew be selected from the remaining flight attendant group.

5.6 Pre-demonstration inspection

- (1) Prior to the conduct of the demonstration, the operator shall ensure the following.
 - (a) If an actual aeroplane is used, the aeroplane is configured and equipped according to the operator's manuals and procedures.
 - (b) If a life-sized mock-up of the aeroplane model or a floating device is used, it meets the criteria specified in subsection 604.226(2) of the CARs.
 - (c) Where the use of a life raft is to be demonstrated, stands should be placed at the emergency exit or wing, with the top of the platform at a height simulating the water level of the aeroplane following a planned ditching.
 - (d) The following personnel are present:
 - (i) safety personnel to prevent participant injury;
 - (ii) operator personnel with the authority to direct demonstration modifications;
 - (iii) the minimum number of proposed flight attendants for use on the aeroplane during airline operations per section 604.221 of the CARs; and
 - (iv) when an operator's procedures include using ABPs to remove or launch life rafts, then the same number of persons who will act as ABPs shall be used in the demonstration.
- (2) For the ditching demonstration, the life raft or slide raft used may be beyond its scheduled inspection criteria. The operator shall identify this option in the demonstration plan. The plan shall state that the operator accepts full responsibility for any failure of the demonstration due to a malfunction of the life raft or slide raft.

5.7 Pre-demonstration briefings

- (1) On the day of the demonstration, two separate briefings should be conducted for the following participants — one for crew members involved in the demonstration and one for ABPs.
- (2) Crew member briefing
 - (a) The operator's ditching demonstration coordinator should provide crew members with the specific briefing information in the demonstration plan, including the key objectives and aspects of the demonstration and a clear understanding of the artificial nature of the demonstration.
 - (b) The operator's demonstration coordinator should discuss the following items.
 - (i) The purpose of the demonstration is to evaluate:
 - (A) the effectiveness of the training program as reflected by the crew members' actions;
 - (B) the adequacy of the emergency procedures; and
 - (C) the serviceability of the aeroplane emergency equipment.
 - (ii) The initiation signal that begins the demonstration shall be clearly specified.
 - (iii) The signal to be used for stopping the demonstration such as a hand-held compressed gas horn, or some other clear audible means should be described. Ensure that the crew members understand that any evacuation activity in progress shall immediately cease with a stop signal.
 - (iv) Safety during the demonstration, crew member responsibilities and safety personnel duties and limitations should be emphasized.
- (3) ABP briefing
 - (a) The operator's ditching demonstration coordinator should provide the ABPs with the specific briefing information contained in the demonstration plan. The demonstration coordinator should:
 - (i) state the purpose of the demonstration;
 - (ii) state that ABPs must pay attention to the flight attendants' instructions; and
 - (iii) emphasize that individual safety is not to be compromised at any time during the demonstration.
 - (b) The demonstration coordinator should not provide any additional information or description of the demonstration.

5.8 Use of personal communication devices

- (1) The operator should consider limiting or restricting the use of personal communication devices, including cellular telephones and smartphones, prior to and during the conduct of the demonstration(s) to limit information sharing among participants prior to the completion of the demonstration.

5.9 Conducting the demonstration

- (1) The operator's ditching demonstration coordinator shall ensure all pre-demonstration briefings and inspections are completed before the actual demonstration.

- (2) The following sequence of events represents an acceptable means, derived from experience, for conducting the demonstration.
- (3) The demonstration shall be conducted during daylight hours or in a lighted hangar.
- (4) The flight attendants should accomplish the following:
 - (a) prepare for a normal departure according to the operator's procedures, including closing and securing all exits and galleys, and arming the emergency evacuation system for takeoff;
 - (b) conduct a passenger briefing in accordance with section 604.85 of the CARs and operator procedures;
 - (c) sit at their assigned positions with their restraint systems fastened; and
 - (d) commence performing duties associated with normal flight, such as serving meals with the cart in the aisle.
- (5) After the commencement of in-flight service, the pilot-in-command shall inform a designated operator employee that the aeroplane is ready. The operator employee shall then inform the operator's ditching demonstration coordinator that the aeroplane and crew members are ready to conduct the demonstration.
- (6) The operator's ditching demonstration coordinator shall ensure that all observers and operator safety personnel are ready and in position.
- (7) The operator's ditching demonstration coordinator shall instruct the pilot-in-command to commence the demonstration.
- (8) The timing will begin when the pilot-in-command initiates the demonstration by following the operator's procedures to prepare for a ditching.
- (9) Within the time limit established in the demonstration plan, crew members should accomplish the following:
 - (a) correctly don life preservers;
 - (b) brief passengers;
 - (c) secure the cabin;
 - (d) complete all required checklists; and
 - (e) be prepared to evacuate.
- (10) At the end of the time limit established in the demonstration plan, the operator's ditching demonstration coordinator shall advise the pilot-in-command to announce that the aeroplane is in the water. At this time, crew members and the aeroplane shall be prepared for a simulated water evacuation.
- (11) The life raft or slide raft shall be launched and inflated according to the operator's procedures.
 - (a) To demonstrate launching a life raft:
 - (i) each life raft stowed inside the aeroplane is removed from its stowage compartment and placed on the cabin floor;
 - (ii) one life raft is moved and positioned at the launch location on the aeroplane by the evacuee(s), at which point the demonstration will pause;
 - (iii) operator personnel will then move the designated life raft into position on the ground, stand, or platform before inflation;

- (iv) evacuees shall deplane and proceed to where the life raft has been positioned; and
 - (v) the demonstration resumes with the inflation of the life raft.
 - (b) To demonstrate launching a slide raft:
 - (i) open the exit in the armed mode, allowing the slide raft to inflate in a normal manner;
 - (ii) detach the slide raft from its door mounting in accordance with the operator's procedures, at which point the demonstration will pause;
Note: Frequently, this demonstration is conducted immediately following the demonstration of emergency evacuation procedures using one of the inflated slide rafts.
 - (iii) operator personnel will position the inflated slide raft outside the aircraft on the ground, stand, or platform;
 - (iv) evacuees shall deplane and proceed to where the slide raft has been positioned; and
 - (v) the demonstration resumes.
- (12) When operator procedures require a survival kit to be attached to a door mounted slide raft, the survival kit shall be attached prior to inflation. All required emergency equipment shall be placed in the rafts.
- (13) Each evacuee shall enter a life raft or slide raft.
- (14) Crew members shall locate and describe the use of each piece of emergency equipment in their assigned raft, describe the use of each item in the survival kit, and erect the canopy.
- (15) The operator may choose to conduct post-demonstration interviews with participants in order to obtain additional information or clarification regarding the demonstration. Appendix B contains sample interview questions.

6.0 Operator's observation team

6.1 Assemble the observation team

- (1) The operator's demonstration coordinator should assemble a team to assist in observing the demonstration.
- (2) The team members should include individuals familiar with aircraft operations, applicable regulatory requirements and safety and emergency equipment.

6.2 Conduct the observer team meeting

- (1) The operator's demonstration coordinator should provide specific team member assignments for the demonstration including the following.
 - (a) Timekeeping — For the demonstration of emergency evacuation procedures, there should be one person who is responsible for the 15-second time limit. This person will sound the signal to end the demonstration, which is used by the exit observers when determining if the exit is ready for use.
 - (b) Positioning — inside or outside the aeroplane.

- (2) An aeroplane diagram should be distributed to each team member showing assigned locations for the demonstration.
- (3) For a demonstration of emergency evacuation procedures, determine which emergency exits shall be opened. Review the method for blocking the remaining exits with the team.
- (4) The operator's demonstration coordinator should review regulatory requirements and demonstration criteria with the team and make certain each team member is aware of the signal to be used to initiate the demonstration and the signal to be used to terminate the demonstration.

6.3 Selecting exits for the demonstration of emergency evacuation procedures

- (1) General
 - (a) After determining which exits will be used, the team should not divulge that information to the crew members.
- (2) Calculating the number of usable exits
 - (a) In aeroplanes with an even number of exits, 50% of the total number of exits (and escape slides, if fitted) shall be used in the demonstration.
 - (b) If an aeroplane has an odd number of emergency exits, subtract one and 50% of the remaining number of exits shall be used in the demonstration.
 - (c) All other exits shall be blocked.
- (3) Ventral (stairs) and tail cone exits
 - (a) These should not be used unless they are paired with another exit. If there is any doubt as to which exits are paired, consult the TCCA National Aircraft Certification Branch or regional TCCA aircraft certification office.
- (4) Exit pairs
 - (a) Exit pairs should be identified in the interior configuration diagram or LOPA.
- (5) Selecting individual exits
 - (a) This demonstration requires opening 50% of the floor-level emergency exits. In addition, 50% of the non-floor-level emergency exits must be opened if this is an assigned flight attendant emergency evacuation duty in the operator's manual.
 - (b) The exits to be used shall be representative of all floor-level emergency exits on the aeroplane. Any emergency exit assigned to a flight attendant as part of his or her evacuation duties may be selected for use during the evacuation demonstration.
 - (c) The exits that are selected do not have to be part of an exit pair. For demonstrations conducted by the aeroplane manufacturer, one exit from each exit pair is selected. While this is still an acceptable method for the operator demonstration, other exit combination possibilities exist and may be selected. For example, if an aeroplane is configured with four flight attendant seats adjacent to the four floor-level exits, it would be permissible to have one exit pair blocked and the other exit pair be demonstrated. This type of combination would meet the requirement of opening 50% of the exits.
 - (d) Where one flight attendant is assigned to open more than one floor-level exit, this exit assignment may be tested in the demonstration to verify that it is realistic and can be practicably accomplished. The operator may select both exits within an exit pair to be opened or blocked in order to evaluate the ability of the flight attendant to open and manage both exits.

6.4 Selecting the raft or slide raft for the ditching demonstration

- (1) Paragraph 604.226(1)(f) of the CARs requires that an operator who carries out a demonstration of its ditching emergency evacuation procedures shall ensure that, as applicable, one life raft or one slide raft is inflated. If the aeroplane is equipped with both types of raft, then a life raft should be the selected raft.
- (2) While each life raft stowed inside the aeroplane is required to be removed from its stowage compartment, only one is then required to be launched (see paragraph 5.9(11)(a) of this AC).
- (3) If the aeroplane is equipped with slide rafts and the operator plans to conduct the ditching demonstration in conjunction with a demonstration of emergency evacuation procedures, the slide raft selected may be one of those that were inflated during the evacuation demonstration (see paragraph 5.9(11)(b) of this AC).
- (4) The operator also has the option to make available a life raft or slide raft that may be beyond its scheduled inspection criteria. The operator shall identify this option in the demonstration plan. The raft selected for inflation must be the same as those used on the aeroplane and it must be equipped as it would be on the aeroplane in regular operations.

6.5 Pre-demonstration briefings

- (1) On the day of the demonstration, separate briefings should be conducted for crew members involved in the demonstration, ABPs involved in the ditching demonstration and the operator's observation team.
- (2) Operator's observation team member briefing
 - (a) The operator's demonstration coordinator should review the following items before the demonstration:
 - (i) the objectives of the demonstration;
 - (ii) the initiation signal;
 - (iii) the observer assignments;
 - (iv) the evaluation requirements;
 - (v) the procedures and responsibilities for timing the demonstration; and
 - (vi) the signal to stop the demonstration.

7.0 Evaluating emergency evacuation and ditching demonstrations

7.1 Evaluation of a demonstration of emergency evacuation procedures

- (1) The following aspects of the demonstration will be noted and evaluated:
 - (a) the location of each crew member during the demonstration;
 - (b) the adherence by crew members to the execution of assigned duties and responsibilities;
 - (c) the effectiveness of crew members in performing assigned duties and responsibilities (for example, a flight attendant's effectiveness in assessing outside conditions, opening exits, and passenger evacuation commands);
 - (d) the coordination and communication between the flight crew members and flight attendants;
 - (e) the operation of emergency equipment; and

- (f) any other deficiencies or delays encountered.
- (2) Ensure that each designated exit was opened and each escape slide was deployed and ready for use within 15 seconds. The observer assigned to each exit will determine if their assigned exit was opened and each escape slide was ready for use before the termination signal was heard.
- (3) The following information should be considered when determining if an exit is ready for use.
 - (a) Floor-level exits with escape slides are considered to be ready for use when the exit is fully opened and the escape slides are completely deployed or inflated and properly positioned in a manner which would not impede passenger or crew member egress. The inflation cylinder may still be making a hissing sound and the escape slide may not actually touch the ground until the first passenger uses the escape slide. Neither one of these situations would prevent the escape slide from being ready for use.
 - (b) Floor-level exits with stairs are considered to be ready for use when the exit is fully opened, the stairs are fully extended, and the bottom of the stairs is within six inches of the ground.
 - (c) Exits not equipped with a means of escape present some different considerations when determining ready for use. In this case, the operator will refer to their procedures and use those procedures to determine when the exit is ready for use. For example, in the case of a non-floor-level emergency exit, the crew member shall remove and place the hatch in accordance with the operator's procedures. In the case of a floor-level plug/hatch on some smaller aeroplanes, this might mean that the hatch falls out of the aeroplane and lands directly under the door sill.
- (4) Although not required, where individual exit preparation time is also being recorded to obtain additional data, the timing stops when the designated exit has been opened and the exit, as well as any egress assist means, is ready for use.
 - (a) Timing for escape slide readiness should be done from outside the aeroplane and stops when the escape slide is ready for use.
 - (b) Timing for stair readiness should be done from outside the aeroplane and should stop when the stairs are fully extended and the bottom is within six inches of the ground.
 - (c) Timing of exits not equipped with an escape means is often easier from inside the aeroplane. The flight attendant shall follow their procedures as provided in the appropriate parts of the manual. The observer should verify that the exit is ready for use and then stop the timing.

7.2 Evaluation of a demonstration of emergency evacuation procedures — ditching

- (1) The following aspects of the demonstration should be noted and evaluated:
 - (a) the adequacy of the preparation of passengers and the cabin for the planned ditching;
 - (b) the location and quantity of safety and emergency equipment available on board (i.e., life rafts, slide rafts, life preservers, medical kits, first aid kits and emergency locator transmitter);
 - (c) proper stowage and accessibility of safety and emergency equipment (Could it be readily removed or ejected from the aeroplane in the time specified?);
 - (d) the availability, adequacy and use of means to prevent emergency equipment from drifting away from survivors;
 - (e) full inflation of the life raft, slide raft, and life preservers within acceptable time limits;
 - (f) serviceability of other relevant safety and emergency equipment; and

- (g) the adherence to procedures and effectiveness of crew members in performing assigned duties and responsibilities (for example, where ABPs assist in launching life rafts during a ditching demonstration, the flight attendant's instructions to the ABPs should conform to the information provided in the operator's manual).
- (2) Ensure that the cabin, passengers, and flight attendants were ready for a water landing within fifteen minutes or a time period based on the operator's ditching procedures (see section 5.1(7) of this AC).
- (3) Ensure that life rafts were efficiently removed from stowage and each designated life preserver, life raft, and slide raft was properly inflated.

7.3 Evaluation of operator procedures and crew performance

- (1) When evaluating operator procedures and crew member performance, the following aspects should be assessed:
 - (a) Were the emergency exits to be used selected, and could such exits be opened readily by the crew?
 - (b) Were emergency procedures and related checklists adequate, and were they properly used by crew members?
 - (c) Could any performance deficiency result from lack of or inadequate training? Were crew members familiar with and did they adhere to the timely execution of their assigned duties and responsibilities?
 - (d) Could crew members, using available safety and emergency equipment and following the procedures outlined in the operations manual, facilitate the evacuation of the aeroplane under critical conditions and in the specified time frame?
 - (e) Were there any other deficiencies that may have hindered the performance of the crew?

7.4 Determination of results

- (1) A demonstration shall be declared unsatisfactory if the specified time limit is exceeded.
- (2) Deficiencies in other areas such as crew member effectiveness, or equipment malfunctions that occur even when timing criteria is met, may be grounds for determining the demonstration unsatisfactory. The severity of the deficiency and the root cause should be considered. For example, the failure of a blocking signal to function as described in the plan, thereby providing an early indication to the flight attendant(s) of the selected exits, will invalidate the demonstration.
- (3) If the cause of a major deficiency was due to improper operator training, procedures, or maintenance, the demonstration should be judged unsatisfactory. For example, if all emergency lighting failed to illuminate due to a maintenance problem, there is sufficient grounds for determining that the demonstration was unsatisfactory. Minor deficiencies can usually be resolved by responsible operator personnel without having to declare the demonstration unsatisfactory.

7.5 Correction of deficiencies

- (1) If a demonstration is not successful, the operator should identify the cause(s) and correct any deficiencies that may have contributed to the failure prior to conducting another demonstration.
- (2) If the deficiency cannot be corrected immediately, the operator should ensure that corrective action is taken prior to rescheduling the demonstration. These corrective actions may include, but are not limited to:

- (a) revising evacuation procedures;
 - (b) improving crew training;
 - (c) modifying or changing the safety and emergency equipment used;
 - (d) changing the passenger compartment arrangement;
 - (e) reducing total passenger seating configuration; and
 - (f) increasing the number of flight attendants.
- (3) Section 6.0 of AC SUR-002 – Root Cause Analysis and Corrective Action for TCCA Findings provides guidance to operators in identifying and achieving effective corrective action.

7.6 Demonstration report

- (1) The operator should consider preparing an emergency evacuation or ditching demonstration report to support the time-encoded video record. The report should include at least the following.
- (a) A completed form for each demonstration attempt. For example, if two demonstrations are unsuccessful and a third is satisfactory, three forms should be completed and retained as part of the demonstration report package. The form should contain the following information:
 - (i) Date and time of demonstration;
 - (ii) Type of demonstration and reason for demonstration (for example, see section 4.2 or 5.2 of this AC);
 - (iii) Number of persons on board (e.g., flight crew members, flight attendants, ABPs, etc.); and
 - (iv) Exits used.
 - (b) The safety features card required by section 604.86 of the CARs.
 - (c) A diagram or LOPA of the aeroplane, including:
 - (i) safety and emergency equipment;
 - (ii) exits;
 - (iii) exits used; and
 - (iv) the number of approved passenger seats.
 - (d) The location of seats that were used by flight attendants.
 - (e) Any deficiencies and corrective actions taken by the operator.
 - (f) Any injuries to participants.
 - (g) Any other associated reports.
- (2) All documents in support of the demonstration of emergency evacuation and ditching procedures should be retained by the operator for at least five years after the day on which the demonstration was carried out to support the time-encoded video record.

8.0 Document history

- (1) Advisory Circular (AC) 604-002 Issue 01, RDIMS 13039244 (E), 13039249 (F), dated 2018-08-17 – Demonstration of Emergency Evacuation and Ditching Procedures – Private Operators

9.0 Contact us

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Appendix A — List of aeroplane “models”

- (1) Sections 604.220 and 705.200 of the CARs refer to the definitions contained in version 1.3 of the document entitled *International Standard for Aircraft Make, Model, and Series Groupings*, dated October 2012 and published by the Common Taxonomy Team of the International Civil Aviation Organization (ICAO) and the Commercial Aviation Safety Team (CAST). Specifically, *model* means *aircraft master series* as described in section 3.7 or, if no aircraft master series is assigned to an aeroplane, *model* in respect of that aeroplane means *aircraft model*.
- (2) The Common Taxonomy Team has produced a list of aircraft based upon the International Aircraft Categorization and Identification Standard (IACIS) reflecting the common taxonomies. Each Canadian air operator certificate contains the aircraft master series for each registered aircraft based upon the IACIS.
- (3) The following table contains a list of aeroplane models that reflect the interpretation of the CARs and are used to determine the flight attendants and emergency evacuation requirements for private operators and airline operators.
- (4) Any difference between the IACIS, the air operator certificate and the data in the list below shall be brought to the attention of Airline Standards (Cabin Safety).

Aeroplane Manufacturer / Type Certificate Holder	Aeroplane Model(s)		
AEROSPATIALE (ATR)	ATR 42-200	ATR 42-300	ATR 42-400
	ATR 42-500	ATR 72-100	ATR 72-200
AIRBUS	A310-200	A310-300	A319-100
	A320-100	A320-200	A321-100
	A321-200	A330-200	A330-300
AIRBUS CANADA LIMITED PARTNERSHIP	BD-500-1A10	BD-500-1A11	
BOEING	717-200	737-100	737-200
	737-300	737-400	737-500
	737-600	737-700	737-800
	737-900	737-8	737-9
	737-8200	747-100	747-200
	747-300	747-400	747-8
	757-200	757-300	767-200
	767-300	767-400	777-200
	777-300	787-8	787-9
BRITISH AEROSPACE CORPORATION	AVRO-146-RJ70	AVRO-146-RJ85	AVRO-146-RJ100
	BAE-146-100	BAE-146-200	BAE-146-300
MHI RJ AVIATION ULC	CL-600-2B19	CL-600-2C10 (700)	CL-600-2D15 (705)
	CL-600-2D24 (900)	CL-600-2E25 (1000)	
DE HAVILLAND	DHC-8-300	DHC-8-400	
EMBRAER	ERJ 170-100	ERJ 170-200	ERJ 190-100
	ERJ 190-200	ERJ 190-300	ERJ 190-400
SAAB AB	SAAB 2000		
VIKING AIR LIMITED	DHC-7-100		

Appendix B — Participant interviews

1.0 Interviews

- (1) Interviewing demonstration participants may assist the operator or Transport Canada team leader with the following.
 - (a) Gaining an understanding of what occurred.
 - (b) Developing recommendations related to operator procedures, training, safety and emergency equipment, etc.
 - (c) Confirming, clarifying or supplementing information obtained from other sources.
- (2) Objectives of the interview include:
 - (a) learning what happened to the person(s) being interviewed;
 - (b) gathering information regarding the sequence of events from the persons perspective; and
 - (c) learning about the actions of the crew members and ABPs.
- (3) Guidance on conducting interviews is provided in this appendix and is based upon guidance contained in Chapter 5 of ICAO Doc 10062 — *Manual on the Investigation of Cabin Safety Aspects in Accidents and Incidents*. Not all items may need to be covered during an interview and questions may be omitted based on the nature of the demonstration.
- (4) The aim of the interview is not to apportion blame; it is to enhance cabin safety and survivability.
- (5) The interviewer should give each person an opportunity to describe in their own words (without interruption) what happened to them.
- (6) After the narrative is finished, the interviewer may ask follow-up questions to determine additional information as required.
- (7) An aeroplane diagram (with seat rows, exits, galleys, and lavatories) is a useful tool to orient a person during an interview.

1.1 Flight attendant interview

- (1) General information
 - (a) Name
 - (b) Operational experience on the aeroplane model in hours or years
 - (c) Work category — flight attendant or in-charge flight attendant
 - (d) Number of different aeroplane models the flight attendant is qualified on
 - (e) Experience as a flight attendant (in years) with current operator/previous operator
 - (f) Any other special qualifications or roles
 - (g) Were you injured? Describe your injuries. When and how were you injured?
- (2) Pre-demonstration activities
 - (a) Describe pre-flight safety checks and any abnormalities.
 - (b) Where were you seated for the demonstration?

- (3) Demonstration information
- (a) Describe if and how you became aware of or were informed of a problem. If briefed by the pilot-in-command, what information were you given? If briefed by another crew member, what information were you given?
 - (b) Describe your location during the demonstration.
 - (c) Describe the pre-occurrence preparations (i.e., type of warning, cabin preparation).
 - (d) Describe the emergency commands you used.
 - (e) Describe the ABPs reaction to your commands.
 - (f) Describe the ABPs brace positions.
 - (g) Describe your brace position.
 - (h) Describe any difficulties you may have had with your seat/safety belt/shoulder harness.
 - (i) Describe any safety or emergency equipment you used: Why and how did you use it? Was it effective? Were you able to locate and access it easily?
 - (j) Describe your view of the cabin. If your view was obstructed, please explain.
- (4) Training
- (a) When was your last evacuation drill? Describe the drill. How often is the drill conducted?
 - (b) When was your last door drill? Describe the drill. How often is the drill conducted?
 - (c) Describe your initial and annual ditching training.
 - (d) Describe your practical training with respect to the use of safety and emergency equipment. Are the training devices representative of the actual equipment found on board the aeroplane model demonstrated?
 - (e) Do you feel that your training was realistic? Explain.
 - (f) Did your training prepare you for what happened? Explain.
 - (g) Did you feel confident in your abilities? Explain.

1.2 Information about specific demonstrations

- (1) Evacuation
- (a) How did you decide to evacuate? Was it due to:
 - (i) the pilot-in-command's order?
 - (ii) personal judgement?
 - (iii) evacuation alarm?
 - (iv) an announcement over the public address system?
 - (b) Which exit(s) did you open?
 - (c) Which exit(s) were you assigned?
 - (d) If you did not open an exit, explain why.
 - (e) Did you have a direct view of your primary and secondary exits from your seat?
 - (f) Did you assess the conditions? How? Were there any difficulties assessing outside conditions?
 - (g) Describe opening the exit(s). Were there any difficulties? If yes, please describe.

- (h) Describe the deployment and inflation of the escape slide(s). Were there any difficulties? If yes, please describe.
 - (i) Did the emergency lights operate? Which emergency lights did you observe?
 - (j) Describe the illumination inside and outside the aeroplane.
- (2) Ditching (if demonstrated)
- (a) Were there any problems deploying, inflating or boarding the slide rafts or life rafts?
 - (b) Did you move a life raft from one location to another? Describe any difficulties.
 - (c) What type of personal flotation device did you use? Where did you obtain it? Did you have any problems obtaining or using it?
 - (d) Did ABPs have any problems obtaining or donning their life preservers?
 - (e) Did any of the APBs inflate their life preserver inside the aeroplane?
 - (f) Did you retrieve any emergency equipment? If yes, where from?
- (3) Additional comments
- (a) Based on your experience, can you suggest any improvements to procedures, training or equipment?
 - (b) Do you have any further information that you think may be of assistance?

1.3 ABP interview (ditching demonstration)

- (1) Personal information
- (a) Name
 - (b) Occupation
 - (c) Seat number and location
 - (d) Aviation experience
 - (e) Were you injured? Describe your injuries. When and how were you injured?
- (2) Pre-flight preparations
- (a) Describe the clothing and footwear that you were wearing during the demonstration.
 - (b) Was there a pre-departure safety briefing? How was it provided (i.e., flight attendant, video or other means)? What information do you recall? Did you understand the safety briefing? Was it helpful?
 - (c) Did you read the safety features card? Did you understand the information on the safety features card? What information do you recall?
 - (d) Did you note the locations of more than one exit near your seat?
 - (e) Were you seated adjacent to an emergency exit?
 - (f) Were you briefed prior to the demonstration on the operation of the exit? If yes, by whom?
- (3) Demonstration information
- (a) How did the crew prepare you for the emergency? Were you given instructions over the PA system? By an individual crewmember? Were the instructions shouted?
 - (b) Did you hear any shouted commands? If yes, what did you hear? Did the information help you?

- (c) Did you remove your shoes? Why?
- (4) Ditching
 - (a) What types of flotation devices were available?
 - (b) Did you obtain a life preserver?
 - (i) Where was it stored?
 - (ii) Did you have a problem retrieving, opening the pouch, or donning the life preserver?
 - (iii) Did you put it on?
 - (iv) When did you inflate it?
 - (v) Did it work properly?
- (5) Additional comments
 - (a) Based on your experience, can you suggest any improvements to passenger briefings, procedures, or equipment?
 - (b) Did you fully understand information provided to you? If not, please describe.
 - (c) Do you have any further information that you think may be of assistance?