



Flight Operations Briefing Notes Cabin Operations Unplanned Ground Evacuation

I Introduction

The primary responsibility of the cabin crew during an evacuation is to direct passengers to evacuate the aircraft using all of the usable exits. The aim of an evacuation is to ensure that passengers and crewmembers leave the aircraft as rapidly and as safely as possible.

Many factors contribute to the successful evacuation of the aircraft:

- The procedural knowledge of the cabin crew: This includes training, experience, and behavior
- The environment inside and outside of the aircraft (e.g., the presence of smoke, fire, the cabin lighting, and outside conditions)
- The passengers' behavior, age, level of fitness, and motivation
- The aircraft configuration, and the layout of the cabin

During an emergency, it is essential for the cabin crew to be able to apply their knowledge of procedures, and rapidly adapt to the situation.

II Statistical Data - Background Information

Unplanned Ground Evacuations

From 1997 through 1999, the US National Transportation Safety Board (NTSB), investigated 46 emergency evacuations, and determined that 31 of the 46 cases

studied were unplanned evacuations. 24 of those unplanned evacuations were the result of an event that occurred during the taxi, takeoff, and landing phases of flight.

III Operational Standards for an Unplanned Ground Evacuation

The Silent Review

The use of the Silent Review, or the 30-second review, is an excellent tool that the cabin crew can use to prepare for the unexpected. The Silent Review helps the cabin crew focus their attention on their duties and responsibilities, and on safety.

The cabin crew should perform the Silent Review during the takeoff and landing phases of flight. This review helps the cabin crew prepare themselves, and enables them to react rapidly.

The Silent Review should contain all of the elements needed to review evacuation duties and responsibilities. It may include, but is not limited to, the following subjects:

- Bracing for impact
- Commands
- Initiating evacuation, if necessary (i.e. Identify under what circumstances the cabin crew will initiate an evacuation: Fire, smoke, life-threatening situations, ditching, no response from the flight crew)
- Operating exits
- Assessing outside conditions
- Self-protection
- Locating the manual slide inflation device
- Locating Able-Bodied Passengers (ABPs).

The following is an example of a Silent Review that uses the first word of each subject to form a word that is easy to remember. This example is called "**OLDABC**":

- **O**peration of exits
- **L**ocation of equipment
- **D**rills (Brace for impact)
- **A**ble-Bodied Passengers and disabled passengers
- **B**race position
- **C**ommands.

IV When Can the Cabin Crew Initiate an Evacuation?

When preparing for takeoff and landing, the cabin crew should be alert to any indication of a possible emergency. Such indications may include fire, smoke, scraping metal, unusual noises, the force of impact, or an unusual aircraft attitude.

Many evacuations are unplanned, and occur without warning. In most cases, the decision to evacuate is made by the flight crew. In a study conducted by the Very Large Transport Aircraft (VLTA) Emergency Requirements Research Evacuation Study, it was determined that in 11 of the 77 accidents analyzed (14%), **information received from the cabin crew played an important role in the flight crew's decision to evacuate.**

In some cases, it may be necessary for the cabin crew to initiate an evacuation, when there is a catastrophic situation, such as:

- Uncontrollable fire
- Dense smoke
- Severe structural damage
- Emergency landing on water
- No communication from the flight crew.

When the cabin crew decides to initiate an evacuation, they must evaluate the level of danger, and the consequences that a delay in decision-making may have. Smoke or fire that is out of control requires a rapid decision, because of the danger it presents to the occupants of the aircraft, its ability to incapacitate rapidly, impair judgment and restrict vision, therefore making the evacuation process difficult.

If the cabin crew considers that an evacuation is necessary, they must attempt to contact the flight crew in order to inform them of the situation.

In these cases, delaying the evacuation reduces the chances of survival.

An evacuation requires cabin crew coordination. Therefore, all cabin crewmembers must be informed that a life-threatening situation exists. There are many ways to inform cabin crewmembers, such as via:

- An evacuation alarm
- A Public Address
- An interphone
- A megaphone.

V Factors Influencing Successful Aircraft Evacuation

An Assertive Cabin Crew

An assertive cabin crew that uses short, clear commands will have an immediate impact on the rapidity of the cabin evacuation. The cabin crew must be assertive in their use of commands, and, if necessary, be prepared to use some physical force to evacuate passengers from the aircraft.

Commands should be:

- Loud
- Clear
- Short
- Well-paced
- Assertive.

Body language is extremely important: The gestures of the cabin crew and tone of their voice must reflect what they want to achieve, because passengers may not always understand the language that the cabin crew is using

Brace Commands

The brace command is the first and most important instruction that cabin crew must provide to passengers in an unplanned emergency. The purpose of instructing passengers to take the brace position is to reduce injuries during impact, in order to increase the chances of survival.

The brace position has two functions: Firstly, it reduces the extent of body movement, due to the fact that passengers must lean or bend over their legs. Secondly, it protects passengers from hitting their head on a hard surface.

When the cabin crew uses the brace commands, it is important that all of the passengers seated in the cabin can hear and understand the commands. If the commands are not synchronized (particularly on smaller aircraft, when the cabin crew is seated close together), the commands may not be audible, and therefore may not be understood by the passengers. This can lead to confusion among the passengers.

Some example of brace commands are: "Heads down", "Stay down", or "Heads down, feet back".

Assessing Outside Conditions

Before opening an exit, the cabin crew must check that the outside conditions are safe, and that the slide deployment area is clear of:

- Fire
- Smoke
- Obstacles
- Debris.

The cabin crew should open the exit, only if it safe to do so.

The cabin crew must hold on to the frame assist handle.

The cabin crew can use commands such as “Stand back, stand back” to hold passengers back from the exit, during the exit opening and slide deployment sequence.

The cabin crew must visually check that the slide is deployed and fully inflated. When the cabin crew confirms that the exit is usable, they can start the evacuation.

The cabin crew should only use the command “Come this way” when a cabin crewmember has confirmed that the exit is usable.

Able-Bodied Passenger (ABP) Commands

The cabin crew should be trained to identify passengers who could be Able-Bodied Passengers (ABPs), in order to assist the cabin crew with safety-related tasks during an evacuation. The cabin crew can easily identify ABPs during the passenger boarding process.

ABPs can assist and protect the cabin crew during the door opening and slide inflation sequence, by keeping passengers back from the exit, until the slide is inflated and conditions are safe.

Use of the Assist Space

Each aircraft has a dedicated assist space located on either side of the door. The cabin crew must firmly grasp the frame assist handle and position themselves correctly in the assist space. This will:

- Prevent the cabin crewmember from being pushed out of the exit
- Prevent the cabin crewmember from interfering with evacuating passengers.

Crowd Control Commands

The cabin crew must have absolute control of the situation, and provide assertive commands and instructions to passengers. There are documented cases of evacuations during which the passengers did not behave appropriately, and did not comply with the instructions provided by the cabin crew.

It is important to note that during evacuations, especially when there is a possible life-threatening situation, passengers may react in many different ways, such as by:

- Panicking (screaming, crying, hysteria)
- Freezing up (not able to react)
- Not being aware that danger exists
- Pushing
- Exiting with carry-on baggage.

Carry-on Baggage

Many studies, such as the Safety Study conducted in 2000 by the US National Transportation Safety Board (NTSB), and investigation reports document the fact that in some cases, it was necessary for the cabin crew to argue with passengers because passengers attempted to carry baggage to the exits during emergencies (in one case, the evacuating passenger tried to exit with his guitar!).

Carry-on baggage brought to the exits can cause blockages and congestion at the exit and in the aisles, and reduce the efficiency of the evacuation.

An Australian Transportation Safety Board (ATSB) report in 2001 reported that in an accident that occurred in 1999, some passengers were authorized to take baggage with them as they evacuated the aircraft. When the cabin crew attempted to enforce that passengers leave their carry-on baggage behind, the passenger flow from the exit became less orderly.

This example illustrates an important point: If the cabin crew gives the command to passengers to leave their carry-on baggage behind **during** the evacuation, this may be too late.

Therefore, the cabin crew should instruct passengers to leave their baggage **at the beginning** of the evacuation. Some examples of possible commands are:

- "Open seatbelts, leave everything"
- "Open seatbelts, no baggage".

The cabin crew can also include this information in the passenger pre-flight safety briefing in order to reinforce the message, i.e.: "If an emergency evacuation is necessary, leave all your belongings behind."

Exit Flow Management Commands

It is essential that passengers evacuate the aircraft immediately. The cabin crew must monitor the evacuation, and maintain an even flow of passengers from each exit, to avoid congestion at the end of the slides. The cabin crew must continually monitor the slide to ensure that it remains safe for use.

During the evacuation, the cabin crew should ensure that they use appropriate types of commands. For example, in a nose gear collapse, the slide may be close to the ground. Therefore, it may not be appropriate to command passengers to “jump and slide”.

The cabin crew should consider the type of commands they will use, according to:

- The type of exit: For example, an overwing ramp/slide
- Single-lane or dual-lane slide
- The attitude of the slide, after slide inflation
- Passengers’ behavior.

To ensure the flow of passenger evacuation, the cabin crew can use commands, such as:

- “Jump and slide”
- “Run and slide”
- “Run, run” (This may be appropriate if the slide is very close to the ground)
- “Two by two” (dual-lane slides)
- “One by one” (single lane slide)
- “Keep moving”
- “Hurry”
- “Stand, Jump” or “Stay on your feet” (This can be used for passengers who insist on sitting on the door sill).

There is an absolute need for crewmembers to assert their authority, in order to avoid delays in getting passengers down the slide and away from danger. It may be necessary to use a certain amount of physical force, in order to encourage some passengers to leave the aircraft.

Unusable Exits

An exit may not be usable at the beginning of the evacuation, or may become unusable during the evacuation.

An exit may be unusable at the beginning of the evacuation, for one of the following reasons:

- The exit is jammed, and will not open
- The slide does not deploy correctly, or the slide is damaged
- There are external hazards, such as fire, smoke, obstacles or debris.

The cabin crewmember who is responsible for the unusable exit must inform the passengers that the exit is blocked, and redirect passengers to the nearest usable exit.

The cabin crewmember must guard the exit to prevent the exit from being used.

When redirecting passengers, the cabin crewmember must know towards which exit to direct passengers. The crewmember should listen for the nearest crewmember(s) giving passengers the command to “come this way” or “jump”, for confirmation that another exit is usable.

The cabin crewmember at the unusable exit must use positive commands and gestures to redirect passengers to the nearest usable exit, with commands such as:

- “Blocked exit”
- “Go across”
- “Go forward”
- “Go back”.

The cabin crewmembers should encourage passengers to move rapidly and to “hurry”.

The cabin crew must also be aware of the environment inside and outside the cabin. If the situation changes, i.e.:

- The slide becomes damaged
- A fire develops in the area
- There are other external hazards.

Then the cabin crewmember at the unusable exit must perform the following actions:

- Stop the evacuation
- Block the exit and redirect passengers to the nearest usable exit
- Guard the exit.

Cabin Configuration

The cabin configuration can have an impact on the rate and flow of the evacuation: e.g. the physical layout of the cabin, the passenger seating density, the access to the exits, the width of the cross aisles, the location of the monuments, etc. The cabin configuration also plays a major role when identifying the areas/exits with the highest/least passenger seating density.

To enhance the situational awareness skills of the cabin crew, they should be familiar with the cabin layout, and the areas where congestion may occur, due to:

- Passenger seating density
- The location of galleys, lavatories, ...
- Restricted visibility
- Passengers arriving from different directions.

It may be necessary for the cabin crew to redirect passengers to other usable exits to avoid congestion, and to maximize the use of all the usable exits, in order to evacuate the aircraft as rapidly as possible. To achieve this, the cabin crew must be aware of what is happening in the cabin during the evacuation.

Exit Bypass

If an exit becomes too congested, the cabin crew can re-direct passengers to another less congested usable exit. This is referred to as exit bypass. The cabin crew can use exit bypass to maintain an even flow of passengers to all of the usable exits, and to maximize their use.

Dried-up Exit

A dried-up exit is a usable exit that passengers are not longer using to evacuate the aircraft. During an evacuation, it is important to maximize the use of all of the usable exits, in order to reduce the evacuation time. When an exit is no longer being used, and if the circumstances permit, the cabin crewmembers at these exits must make every effort to attract passengers to these exits.

Pre-Cabin Crew Evacuation

When the flow of passengers to the exit begins to slow down, the cabin crew should check the cabin and call all remaining passengers to the exits.

When the flow of passengers has stopped, the cabin crew should check their assigned area for any remaining passengers.

When the cabin crewmember's assigned area is empty, or it is no longer safe to remain onboard the aircraft, the cabin crewmember should evacuate through the first usable exit.

If an evacuation occurs away from an airfield, the cabin crew should take emergency equipment from the aircraft, if the situation permits.

Whether evacuating off airport or at an airfield, it is extremely useful for cabin crew to have a megaphone to manage passengers on the ground after the evacuation.

Post-Evacuation Responsibilities

When the cabin crew is outside the aircraft, they are responsible for the passengers, until they are relieved by the emergency services or by the authorities. The cabin crew should perform the following actions to ensure passenger safety:

- Direct passengers upwind, and away from the aircraft
- Assemble passengers and keep them together
- Direct passengers away from, fuel, fire and vehicles
- Assist passengers, and provide first aid, if necessary
- Enforce a NO SMOKING policy
- Make a passenger headcount, if possible.

VI Passenger Safety Briefings

Many studies have been conducted regarding passenger attitudes towards safety briefings. The following are some of the findings of these studies.

The US National Transportation Safety Board studied the Emergency Evacuation of Commercial Airplanes (NTSB 2000), and found that 54% of passengers said that they had not watched the entire safety briefing, because they had seen it before.

In another study conducted by P. J Fennel and H.C Muir 1992, passengers received questionnaires via travel agents, in order to research passengers' attitudes towards safety briefings. In these questionnaires, passengers indicated that safety briefings would be more effective, if:

- They were introduced appropriately
- Passengers were informed that the safety equipment on all aircraft is not the same
- Passengers were informed that it is in their interest to pay attention
- The cabin crew appeared more interested in the way that they presented the safety information.



These are just some of the comments from the study. However, it is important to note that these studies demonstrate that passengers prefer that their safety be a shared concern between the Operator and the cabin crew.

Safety briefings should focus the passengers' attention on safety, and make passengers aware that it is in their interest to pay attention. When introducing a safety briefing, the cabin crew can increase passenger awareness by using phrases such as "For your safety" or "As your safety is important to us".

The cabin crew should emphasize the importance of:

- Listening and watching the safety briefing
- Being aware of the location of safety equipment: i.e. safety cards, exits, and seatbelts.

When cabin crew is required to perform a safety demonstration, the cabin crewmember that makes the safety announcement must speak slowly and clearly. The cabin crewmember should also pause at key points during the announcement to enable the cabin crew sufficient time to demonstrate.

The cabin crew should be animated, and try to make eye contact with as many passengers as possible in order to attract the passengers' attention to the safety briefing. This also applies to the cabin crew when they provide safety demonstrations and audiovisual safety presentations.

When using an audiovisual presentation, the cabin crew should take their positions in the cabins, and point to the exits.

VII Factors Affecting Operational Standards

Analysis of in-service events reveals that operational standards may not be effective or applicable in the following situations:

- A procedure is not applied correctly:
 - A cabin crewmember is not at their designated exit during takeoff and landing, and leaves the exit unattended.
- Cabin crew training is not sufficient:
 - The cabin crew does not have the skills to efficiently evacuate an aircraft
 - The cabin crew lack training in crew communication and coordination skills.
- Operational procedures are not sufficient:
 - The Operator does not include the Silent Review in the standard operating procedures
 - The Operator does not permit the cabin crew to initiate an evacuation

- The Operator does not provide guidelines to the cabin crew that explain when the cabin crew may initiate an evacuation.
- The communication with passengers is not effective:
 - The cabin crew does not provide assertive commands
 - The cabin crew's commands are negative or complicated.

VIII Prevention Strategies

It is impossible to prevent a necessary unplanned evacuation. However, if an unplanned evacuation is required, it is possible to take preventive steps that will help in achieving an efficient evacuation.

The cabin crew should:

- Be regularly trained, and demonstrate proficiency in the use of emergency procedures and equipment.
- Ensure that the communication and coordination between the flight and cabin crew is effective when an emergency event occurs
- Attract passengers' attention to safety briefings
- Remember the importance of assertive commands and gestures during an evacuation
- Be aware of their surroundings and implement an appropriate evacuation technique, depending on the exit and situation.

IX Summary of Key Points

- Operators should encourage the cabin crew to use the Silent Review as part of the company standard operating procedures, to enable the cabin crew to be prepared for an unexpected event
- Operators should ensure that evacuation procedures include effective commands and actions that the cabin crew can use during an evacuation
- Operators should ensure that the cabin crew knows how to use the emergency door in the power assist mode and the door power assist failure
- The cabin crew must be assertive in order to efficiently evacuate the aircraft
- Operators should regularly include updates in their procedures and training, and any amendments/recommendations should reflect the current industry standards
- Operators should review incidents that occur during operational flights in order to update existing procedures, and include them cabin crew emergency training.

X Associated Flight Operations Briefing Notes

The following briefing notes can be consulted for additional information:

- **Planned Ground Evacuation**
- **Effective Briefings for Cabin Operations**
- **Crew Communication**

XI Regulatory References

- FAA AC 121-24C Passenger Safety Information Briefing and Briefing Cards
- JAR-OPS 1.1005 – Cabin Crew
- Transport Canada - Commercial and Business Advisory Circular No. 0188

XII Airbus References

- A320 Family, A330 & A340 Cabin Crew Operations Manuals (CCOM)
- Getting to Grips with Cabin Safety (brochure)

XIII Additional Reading Materials / Websites References

- Transportation Safety Board of Canada (TSB) - A safety Study of Evacuation of Large, Passenger-Carrying Aircraft (Report SA9501):
<http://www.tsb.gc.ca/en/reports/air/studies/>
- National Transportation Safety Board (NTSB) – Aviation Safety Studies & Special Report – Emergency Evacuation of Commercial Airplanes (Safety Study SS--00-01):
http://www.nts.gov/publictn/A_Stu.htm
- Very Large Transport Aircraft (VLTA) Emergency Requirements Research Evacuation Study (VERRES) – A project Summary: **http://fseq.gre.ac.uk/fire/verres_WP4%20.pdf**
- Australian Transportation Safety Board (ATSB) - Aviation safety – Aviation Publication - Evacuation Commands for Optimal Passenger Management (02-May-2006): **<http://www.atsb.gov.au/>**
- Flight Safety Foundation – Publications – Cabin Crew Safety July-August 2000

This publication is available on the Flight Safety Foundation website:
<http://www.flightsafety.org/home.html>

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