Safety first

The Airbus Safety magazine

Attention! Crew at Stations!

An emergency evacuation is always a stressful situation for passengers, cabin crews, and flight crews. Decisions have to be made rapidly and if the communication between the cabin and cockpit is not clear, or the evacuation is delayed by passengers trying to take their personal belongings, these can have critical consequences on the outcome.

From the preflight briefing until the safe evacuation of all aircraft occupants, this article provides recommendations for both flight crew and cabin crew to ensure a safe and efficient emergency evacuation is performed.

This article is also available on safetyfirst.airbus.com and on the Safety first app for iOS and Android devices.

CASE STUDY 1

Event Description

An A319 was taxiing along the taxiway when the passengers and the cabin crew detected smoke in the cabin. The purser used the interphone to notify the flight crew and asked the captain's permission to evacuate. The captain set the parking brake to stop the aircraft on the taxiway, and called ATC to report that they detected smoke in the cabin and that they would initiate an emergency evacuation.

As the smoke became thicker in the cabin, the purser called again to the cockpit, insisting that an evacuation was necessary and requested that the captain urgently initiate the evacuation. The captain turned on the evacuation alarm by pressing the COMMAND pushbutton-switch on the EVAC panel to initiate the evacuation, but did not make an announcement to the cabin using the Passenger Address (PA) system.

The cabin crew immediately began the evacuation but both engines were still running.

The cabin crew at the rear doors of the aircraft had to hold up the passengers ready to evacuate the aircraft for more than 30 seconds until the engines were shut down. The flight crew saw the ECAM alert indicating that the doors were open with engines running, and shut down the engines using the engine fire pushbuttons instead of the master switches.

Event Analysis

Without the presence of any ECAM alerts and with pressure from the cabin crew, the captain initiated the emergency evacuation. The QRH EMER EVAC procedure, that specifically requests the flight crew to ensure that the engines are shut down before initiating the evacuation, was not followed.

Because no announcement was made in the cabin for the evacuation, some passengers mistook the evacuation alarm as a smoke alarm and they did not immediately react, causing some delay to begin the evacuation. Other passengers gathered their personal belongings, this resulted in some minor injuries caused by people pushing past them or climbing over one another in the aisle to reach the exits.

CASE STUDY 2

Event Description

The left engine of an A320 suffered a contained failure during the takeoff roll at a ground speed of 31 knots. The captain immediately rejected the takeoff and brought the aircraft to a stop on the runway. He announced "ATTENTION CREW ON STATION" twice. The flight crew completed the ECAM actions, shut down the left engine, and contacted the Rescue and Fire Fighting Services to make sure that no fire was visible outside the aircraft. The flight crew decided to taxi the aircraft off the runway and were about to tell the cabin crew to resume normal operations, but the purser had already initiated an emergency evacuation.

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Event Analysis

The purser initiated the emergency evacuation and did not inform the flight crew despite the "ATTENTION CREW ON STATION" announcement, which clearly indicated that the flight crew was in control of the situation.

Lack of knowledge of the communication system hindered communication between the crew members. Even though there was no sign of immediate danger, the purser initiated the emergency evacuation without a decision from the captain and with the right engine still running.

Fortunately, only some passengers suffered minor injuries, some of which were caused by them being blown over by the jet exhaust coming from the right engine that was still running. Many of the passengers gathered their personal belongings and took these with them when they evacuated the aircraft.

BE PREPARED FOR EVACUATION

Being prepared makes it easier to perform an emergency evacuation and will help the crew in their capacity to make decisions and apply the Standard Operating Procedures in a stressful environment.

Aircraft Knowledge

To ensure efficient evacuation, the cabin crew must have extensive knowledge of the aircraft systems. This includes the cabin communication system and the aircraft configuration, especially the cabin layout that could impact visibility of the cabin and other cabin crew members or generate congested areas. Operating a diverse fleet can imply various cabin configurations that have different numbers of exits or positions of galleys and toilets. Cabin crew must be familiar with the cabin layout to ensure an efficient emergency evacuation.

Crew Briefing

Maintaining effective communication and ensuring compliance with the Standard Operating Procedures starts with the preflight briefing. This is when the flight

"Maintaining effective communication and ensuring compliance with the Standard Operating Procedures starts with the preflight briefing."

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crew and cabin crew should define together any parameters that could affect their decision-making if an emergency were to occur. It is also the opportunity to review the emergency evacuation procedure with the associated standard callouts, and discuss them in the context of the upcoming flight. The crew should take into account any specific conditions such as airport equipment, external conditions, and the application of MEL items.

Passenger Identification & Briefing

At the beginning of the flight, the cabin crew must select the Able Bodied Passengers (ABP) who are able to assist them in the case of evacuation. They must also identify any passengers who may require additional support during evacuation for example unaccompanied children.

The preflight briefing will help passengers to be better prepared for an evacuation if passengers are encouraged to pay attention. The cabin crew will indicate the location of the nearest emergency exits, and should remind passengers to leave all personal belongings inside the aircraft in the event of an evacuation.

 BEST PRACTICE

The Silent Review

The silent review (or 30-second review) is recommended for cabin crew to mentally recall the key aspects of the emergency evacuation procedure while they are seated at their station before each takeoff and landing, and decreases the risk of distraction. This silent review will help the cabin crew to focus and be prepared in case an emergency evacuation is required. This technique will also help to minimize the startle effect.

STOP - INFORM - ECAM - ASSESS

In the case of an emergency situation during takeoff or landing, task sharing should be established and respected so that the crew are well prepared for a potential emergency evacuation.

Stop the aircraft

The flight crew must bring the aircraft to a stop and set the parking brake. In the case of fire, they should consider positioning the aircraft so that the wind direction will blow the flames away from the fuselage.

Inform ATC

Once the aircraft is stopped, the flight crew should notify the ATC.

Captain: Inform Cabin Crew

After the aircraft stops, the captain tells the cabin crew to prepare for a possible evacuation. The "ATTENTION CREW AT STATION" callout is made through the

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Passenger Address system, which lets the cabin crew know the flight crew is not incapacited and that they are performing actions to determine if evacuation is required. This callout avoids unnecessary evacuations initiated by the cabin crew.

First Officer: Clear ECAM Actions

The first officer should independently perform any ECAM action in a "read and do" manner. On A220 aircraft, the first officer should independently perform the Electronic Checklist (ECL) procedure from any EICAS message in a "read and do" manner.

When the ECAM actions (or ECL procedures) are completed, the first officer can then assist the captain with the situation assessment.

Captain: Assess the Situation

The captain should use any possible means to get a clear and comprehensive overview of the situation. They can use direct communication with any relevant person, for example, cabin crew, ATC, ground personnel, Rescue and Fire Fighting Services. The decision to evacuate should rely on the captain's judgement based on their assessment of the overall situation.

Cabin crew: Assess the Situation and Identify Usable Exits

As soon as the flight crew informs the cabin crew of the possible evacuation, the cabin crew must assess the situation at each cabin station. They should identify the available exits and begin to assess the outside conditions as well as the conditions inside the cabin. The cabin crew must communicate any pertinent information to the flight crew.

> "The decision to evacuate should rely on the captain's judgement based on their assessment of the overall situation.

DECIDE - SECURE - INITIATE

Decide if evacuation is required

The situations that lead to an emergency evacuation are very stressful with a high workload in a short period of time for both flight crew and cabin crew. The

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decision to evacuate is irreversible and can have severe consequences. The main factors that result in the crew initiating an emergency evacuation are uncontrollable fire, thick smoke, and severe structural damage.

In most cases, the flight crew initiates the evacuation. However, in catastrophic situations with immediate risks of life-threatening injuries or when the flight crew is incapacitated, the cabin crew can decide to initiate the evacuation.

No evacuation required

If the situation does not require an evacuation, the captain should notify the cabin crew and ATC, and should resume normal operations.

Need for evacuation

If the situation requires an evacuation, the captain calls for the EMER EVAC procedure to be performed.

Secure the aircraft as per EMER EVAC Procedure

To ensure safe evacuation, the flight crew must secure the aircraft before the evacuation is initiated by performing the following actions:

- ① Check the cabin ΔP=0 on the CAB PRESS SD page to prevent explosive door opening due to residual pressure if manual pressure mode was used in flight.
- ② Set all engine master switches to OFF
- ③ Press all engines and APU FIRE pushbuttons to secure them
- ④ Press relevant ENG and/or APU AGENT pushbuttons as required in case of engine and/or APU fire.

On A220 aircraft, step ① is performed after step ④. The flight crew ensures cabin ΔP=0 by setting the EMER DEPRESS guarded switch to ON.

"To ensure safe evacuation, the flight crew must secure the aircraft before the evacuation is initiated"

(fig.1) Example of the A320 aircraft securing steps before evacuation initiation

① Check **ΔP=0**   ② All **ENG MASTER OFF**   ③ **ENGINES & APU FIRE pushbuttons** pressed

④ **Press engine(s) and/or APU AGENT pushbutton(s)** as required
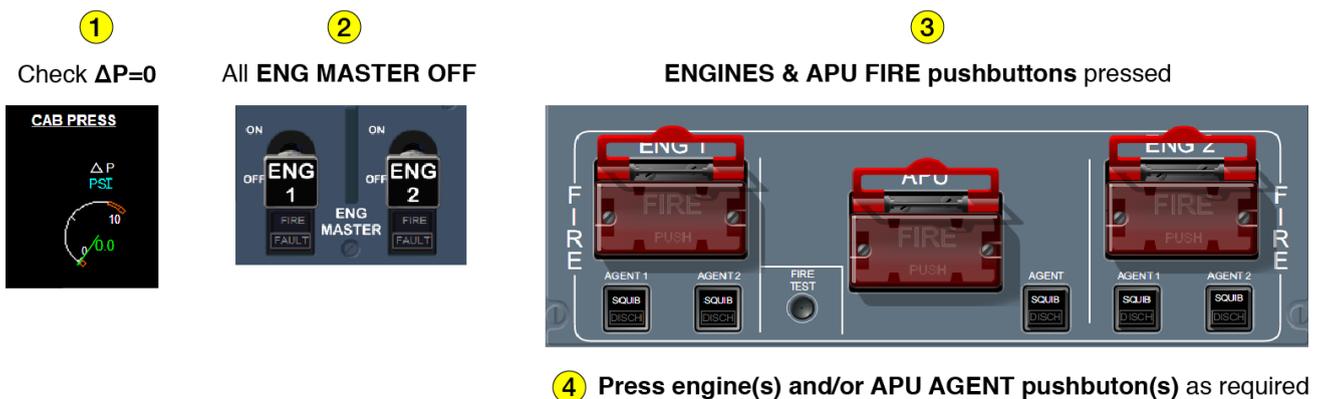
Order from flight crew

The captain initiates the evacuation with a short and clear announcement to the cabin crew over the PA.

For aircraft equipped with the EVAC panel (optional for A300-600/A310/A320/A330/A340/A350 aircraft, standard for A380 aircraft), the

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captain presses the EVAC COMMAND guarded pushbutton-switch. For A220 aircraft, the captain presses the EVAC CMD guarded switch. This ensures clear communication with the cabin crew and helps the flight crew to focus on other actions in this high-workload situation.

Immediately after the emergency evacuation is initiated, the captain advises the ATC.

(fig.2) Example of EVAC panel on A350 aircraft

📋 NOTE

On A220, A330/A340 aircraft equipped with aircraft modification 49314 (CIDS emergency power update), A340-500/600, A350, and A380 aircraft, the flight crew must switch off the batteries. This is to make sure that after the aircraft comes to a stop, power is still supplied to the CIDS for 10 minutes. This is required by regulations in the case of emergency evacuation due to an electrical emergency.

Order from cabin crew

The cabin crew can initiate an emergency evacuation only in the case of a catastrophic event or if the flight crew is incapacitated and normal disembarkation is no longer possible. The cabin crew can use the EVAC command available on the Flight Attendant Panel or as an option on any Additional Attendant Panel. They can also use this command to request that the flight crew initiate an evacuation if they are not authorized to do so directly.

🔑 KEYPOINT

Even if the cabin crew can initiate an emergency evacuation they must try to contact the flight crew first to avoid any unnecessary evacuation.

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Forward Attendant Panel (FAP)

(fig.3) Example of Forward Attendant Panel (FAP) lower section A320 aircraft

Evacuation command button

EVACUATE, EVACUATE, OPEN SEAT BELTS!

An efficient evacuation is a quick and safe evacuation

The objective of an emergency evacuation is to evacuate all aircraft occupants as quickly and as safely as possible to ensure they have the best chance of survival in the case of a life-threatening situation.

Therefore, after the cabin crew identify the usable exits and check that the slides are deployed and inflated, the objective for them is to maintain an evenly-distributed flow of passengers towards all available exits.

Crew Coordination and Adaptation

Throughout the evacuation process, a constant real time assessment of the situation is necessary in terms of aircraft and external conditions, exit usability, and passenger flow. The situation can change rapidly and efficient communication between all the crew is essential to share any elements that can impact the evacuation: Presence of immediate danger such as fire or smoke, an exit becoming unusable due to a damaged slide or external conditions, a congested exit, or an exit with a reduced flow of passengers.

As a result, the crew must rapidly make decisions and adapt to changing scenarios in a dynamic and stressful environment. This will ensure a constant flow of passengers to each usable exit, and therefore, a quick evacuation.

Passenger Management

Multiple and unpredictable behaviors

Under stressful conditions, people can have varied reactions. Unlike cabin crew who are trained, passengers are not. They can have unpredictable reactions that can jeopardize their own safety and that of the other aircraft occupants. Panic can lead to "frozen" passengers overwhelmed by the situation or passengers trying to evacuate as soon as possible by aggressively pushing past other passengers as referred to in Case Study 1.

Risks to slow down the evacuation

Passengers that do not comply with cabin crew instructions can put the success of an evacuation at risk. Baggage retrieval, use of phones, and not jumping on

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the evacuation slides are the most common factors that slow down an evacuation.

Be assertive!

Assertive management of passengers is key to dealing with the risks that could impact the success of an evacuation. The cabin crew must use clear and concise orders, and use a loud voice and assertive body language to ensure that all passengers follow their instructions. The challenge for the cabin crew is to switch from a nice and smiling cabin crew to an assertive one able to use physical force, if necessary.

Evacuation of the Crew

Each cabin crew member should check for any remaining passengers, and as soon as their assigned area is empty, evacuate the aircraft.

When the actions are completed in the cockpit, the first officer should assist the cabin crew with the evacuation of the passengers in the cabin, if accessible, and on the ground.

The captain should be the last crew member to evacuate the cockpit and the last one to evacuate the aircraft after a final check that all aircraft occupants have evacuated. They are in charge of the operations on ground until the rescue and emergency services arrive on site.

Keep focused even after the evacuation

After evacuation, the crew remains responsible for the passengers until the rescue and emergency services arrive. In 2008, after a successful evacuation, one passenger went back inside the aircraft using an evacuation slide to retrieve their personal belongings.

To prevent this situation from occurring, the cabin crew should gather the passengers away from the aircraft and from any potential danger. They should also count them and provide first aid, if necessary. For that, they have to take any necessary equipment during the evacuation to help them with crowd management on ground such as flash lights (if night conditions) or megaphones if not at an airfield.

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THE IMPORTANCE OF REALISTIC TRAINING

To be able to deal with these stressful situations, appropriate training is crucial for both the flight crew and the cabin crew.

For Flight Crews

The emergency evacuation procedure applies the same philosophy to all Airbus aircraft. This consistency across the Airbus fleet and over time is a positive contributing factor to ensuring safe application of the procedure. The emergency evacuation procedure is short and clear, the key factor is how it is trained.

It is essential that the flight crew members understand task sharing: they have to know exactly what actions must be performed, by whom, and when. It is important for the flight crew to keep in mind when to work independently and when to come back together. To help understand this, the training scenarios need to be as realistic as possible and especially have to simulate the high workload that is often encountered in these situations. Instructors should be able to keep the captain busy by simulating conversations with ATC and the cabin while the first officer is performing the ECAM actions. It trains captains not following first officers actions in this specific situation and first officers continuing with ECAM actions without captain confirmation.

For Cabin Crews

Cabin crew training is both theoretical and practical. Scenarios have to be as realistic as possible, based both on evacuations and on a return to normal operations. Cabin crew training should be conducted on a training device in order to create a realistic environment and based on case studies where possible. This enables trainees to learn from past experience and it highlights the importance of reporting incidents to learn from in the future.

The Cabin Safety training is designed using regulations by EASA and FAA and approved by local airworthiness authorities. It is performed annually and includes the emergency evacuation procedure.

The standard training focuses on exit and slide management, but the latest publications from aviation authorities such as the EASA and the FAA, encourage trainers to put more emphasis on passenger management, especially techniques to discourage passengers from retrieving personal belongings or baggage because it has a significant impact on the efficiency of any evacuation.

CRM Training

Given the importance of communication and crew coordination, Crew Resource Management (CRM) training is of utmost importance for both flight crews and cabin crews. It should include stress management, decision-making, leadership, human factors, including surprise and startle effect management, and risk assessment.

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ⓘ INFORMATION

For more information on managing emergency evacuation, you can watch the "*Evacuation Management*" video available on the Airbus Worldwide Instructor News (WIN) website.

Preparation by flight crews and cabin crews is key to conducting an effective and efficient emergency evacuation. Clear communication and the knowledge of Standard Operating Procedures are vital. Knowing the aircraft systems and the cabin layout is fundamental for cabin crews.

The preflight crew briefing and the passenger safety briefing help ensure everyone onboard the aircraft is better prepared to face an emergency evacuation scenario.

The silent review that cabin crew should perform before takeoff and landing is an excellent technique that helps the crew to remain focused and to be ready to act in the case of an emergency.

Knowing the essential steps and the associated task sharing of any evacuation STOP - INFORM - ECAM - ASSESS - DECIDE - SECURE - INITIATE, and regularly practicing realistic training scenarios can save lives in the event of an emergency.

When emergency evacuation commences, passenger management can have a huge impact on the outcome. Passengers may feel disoriented, panicked, and helpless. Their behaviors, such as retrieving their personal belongings before moving to the nearest exit, not only endangers their own safety but also the safety of others. Well-trained and assertive cabin crew are required to urge passengers to move to the nearest available exit and to assemble outside the aircraft in a safe place away from the aircraft.

An emergency evacuation is always a dynamic situation where time is critical, and it requires constant situational awareness combined with rapid decision-making. This can only be achieved through efficient coordination and communication between all flight crews, cabin crews, ATC, and rescue and fire fighting services on ground.

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