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AIR PILOTS - COMMERCIAL AIR TRANSPORT SAFETY BRIEFING NOTE 15

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EMERGENCY EVACUATION BEFORE TAKEOFF

The Context

Emergency evacuations between the start of boarding until the aircraft is airborne are amongst those most likely to occur without warning and potentially before the cabin safety briefing has been completed. They may present unique challenges and subsequent investigations often find that important lessons can be learnt in respect of the evacuation itself rather than what led to it even if there were no casualties. Operators are very likely to learn from their own experience and adapt procedures and/or crew training accordingly but lessons from the experience of others is often missed. Examples of what can happen are provided below and potentially relevant recommendations based on a wider analysis of this scenario then follow.

Some examples of pre takeoff emergency evacuations

- In 2014, as an Airbus A330-200 pushed back at Karachi, a dense hydraulic fluid mist entered both flight deck and passenger cabin. When, with the pushback complete, the Captain was advised that visibility in the cabin was down to four rows and that a localised fire had occurred during attempted cabin crew use of Protective Breathing Equipment, he ordered an evacuation onto the ramp. ATC then failed to secure the area around the aircraft. The cabin safety brief had been completed just before the fluid mist entered the cabin.¹
- In 2016, a Boeing 767-300 high speed rejected takeoff at Chicago followed a right engine failure and ATC advice of fire. Sight of the right engine on fire from the passenger cabin resulted in an immediate evacuation without flight crew awareness before the left engine was shut down. The available 'evacuation signalling system' at all cabin crew stations was inexplicably not activated. The left engine shutdown delay was attributed to inappropriate emergency checklists and the pilots' lack of awareness of both the rapidly increasing cabin smoke and the passengers' view of the engine fire.²
- In 2016, thick white smoke suddenly appeared in the cabin of a fully loaded Airbus A330-300 at London Heathrow prior to engine start with the door used for boarding still connected to the air bridge. An emergency evacuation initiated by cabin crew was accomplished without injury although amidst some confusion due to a brief conflict between flight crew and cabin crew instructions.³
- In 2017, a Boeing 737-800 stopped taxiing at Tokyo Haneda due to poor visibility in heavy snow. Engine oil-sourced smoke/fumes were then detected coming from the air conditioning system. Flames seen coming from the right engine led to its shutdown and an evacuation. Many passengers retrieved baggage from overhead bins and, where possible, cabin crew then confiscated it prior to slide access. Evacuation using only the four doors took nine minutes.⁴
- In 2018, smoke from the air conditioning system entered an Airbus A319 passenger cabin as the aircraft taxied out at Helsinki and began to intensify. The flight deck was unaffected. The Captain was notified, stopped the aircraft and authorised an emergency evacuation but without first completing the pre-evacuation checklist. The required Captain's PA announcing an evacuation was not made but the cabin crew began to evacuate immediately with the engines still running. Uncertainty, confusion and a disorderly evacuation followed. An evacuation need which was only obvious in the passenger cabin was not foreseen by the flight crew.⁵

¹ see: https://www.gcaa.gov.ae/en/departments/airaccidentinvestigation/Lists/Incidents_Investigation/Reports/Attachments/34/2014-2014 - Final Report, AAIS Case AIFN-0016-2014, A6-EAQ, Serious Incident.pdf

² see: <https://www.nts.gov.investigations/AccidentReports/Reports/AAR1801.pdf>

³ see https://assets.publishing.service.gov.uk/media/5a0abe2eed915d0adcd4727/Airbus_A330-323_N276AY_12-17.pdf

⁴ see: https://www.mlit.go.jp/jtsb/eng-air_report/JA322J.pdf

⁵ see: https://www.turvallisuustutkinta.fi/material/attachments/otkes/tutkintaselostukset/en/ilmailuonnettomuuskientutkinta/2018/T6G2yzGLh/L2018-04_final_report.pdf

- In 2019, the left engine of an Airbus A320 departing London Stansted at night failed catastrophically almost immediately thrust was set but was contained with no fire. After a low-speed rejected takeoff, the crew were about to taxi the aircraft off the runway when without any attempt at flight deck contact, the senior cabin crew ordered an immediate evacuation. Passengers using the right side exits were at risk of serious injury from jet blast and ten sustained minor injuries after being blown over by the efflux from the still-idling engine which was only shut down when the Captain saw passengers in front of the aircraft and realised what was happening.⁶

Safety Recommendations

To Aircraft Operators

- Emergency Engine Fire procedures should be reviewed to ensure that ground and in-flight checklists are separate and that the former is compatible with the evacuation checklist which should require that all engines are shut down prior to initiating a passenger evacuation.
- All airports used should be checked to ensure they have appropriate procedures in place to respond to an emergency evacuation onto the ramp during boarding or pushback.
- Cabin crew must have clear instructions on the wide range of potential evacuation scenarios involving fire, fumes or smoke alone or in combination. These must also cover how and when to commence and conduct evacuations, indicating circumstances when the senior (or in indeed any) cabin crew can initiate evacuations for good reason, such as in the event of a self-evident external or internal hazard with flight deck contact impossible or impracticable, whilst aware of the possible risks of them doing so.
- Ensure that the Operations Manual requires Captains encountering an abnormal circumstance which may also appear as such in the passenger cabin to communicate on the PA system at the earliest possible opportunity either an evacuation command, an “attention, crew at stations” alert if initially unsure whether this will be required or a “remain as you are” if evacuation can be firmly ruled out.
- For emergency exits without adjacent cabin crew where a suitable passenger is located and briefed on use of the exit, consider providing standardised wording and requiring confirmed understanding as well as including mention of this procedure in the general passenger safety brief.
- Foreseeable potential problems which may occur during any emergency evacuation such as the following should always be covered during initial and recurrent cabin crew training:
 - malfunctioning or incorrectly deployed slides
 - responding to exits unusable due to malfunction or external circumstances
 - stressing use of nearest available exits and managing any problems if this does not happen
 - dealing with unacceptable items of cabin baggage at exits
 - managing the consequences of smoke or fumes with or without consequential poor visibility
- Flight crew training should cover the possibility that they may be unaware of the consequences of a known aircraft malfunction in the passenger cabin in terms of a potential need for evacuation.
- If applicable, ensure that cabin crew training covers any secondary responsibility for an exit which has been allocated to a pre-briefed passenger and the risk that if they move in the opposite direction to evacuating passengers, it may impede the overall completion of an evacuation.
- At least consider requiring that the Captain is advised that the cabin safety brief is complete and cabin crew are at stations prior to either pushback or taxi rather than prior to takeoff. This earlier safety brief could be supported by an immediate short Captain’s PA at door closure.

To Pilots

- Never authorise cabin crew to commence an emergency evacuation unless the corresponding flight crew checklist has been completed first, especially but not only the shutdown of all engines.
- Ideally, the Captain should always personally announce any emergency evacuation over the PA system to stress urgency and if essential add specific guidance on external hazard avoidance.
- In the event of any issue with PA use to order evacuation, ensure interphone communication with the senior cabin crew is used. It should also be used to advise exits which are/may be unusable whilst aware that cabin crew at particular exits will be the best judges of exit suitability for use.
- Be aware that without cabin crew advising the pilots of both conditions in and as viewed from the cabin, the actual need for or perceived urgency of an evacuation may not be apparent.
- Recognise that there may be circumstances where evacuation is deemed essential and urgent by the senior cabin crew and they may be justified in going ahead without the Captain’s authorisation.

⁶ see: https://assets.publishing.service.gov.uk/media/5f21754ad3bf7f1b0fa79fc7/Airbus_A320-214_OE-LOA_09-20.pdf