



# Jump and Slide

Few cabin crew will experience a real cabin emergency evacuation incident but remains an event for which they must be constantly prepared through effective training. Simulation and industry-wide lessons learned are the foundations of effective training, as **PAUL E EDEN** reports

**S**eatbelts off!" "Leave everything!" "Jump and slide!" An Airbus Flight Operations Briefing Notes document recommends cabin crew use these commands in the event of an emergency cabin evacuation. They should be: "Loud, clear, short, well-paced, assertive and positive," it states.

Successful cabin emergency evacuation is all about well-trained crews working quickly and calmly in potentially life-threatening circumstances, their performance honed through recurrent training designed to equip them for an eventuality that is unlikely to happen.

Mark Mannering, responsible for cabin safety at British Airways, says: "Our trainers use examples of past events from across the industry to create realistic evacuation scenarios. It works very well for us; cabin crew state that their 'training just kicked in' on the rare event they've been involved in a safety-related incident."

The airline bases its cabin crew training on a mix of classroom and cabin-based learning. "As well as regulatory requirements, we train our crew for different types of evacuation – planned, unplanned,

water – and a multitude of realistic scenarios. The common thread for all evacuations is successful crowd control. Our cabin crew must learn to assess the immediate environment and then take control of the flow of passengers," Mannering says.

"The majority of our evacuation training takes place in our full-scale cabin mock-ups which have recently been updated. These are housed in our new, state-of-the-art Global Learning Academy. We also have door simulators, a fire ground, full-height evacuation slides and slides in the 'raft' position. The training, for new entrants and recurrent, is based on the simulation of a range of scenarios – some involving smoke and heat.

"In our recurrent training we keep skills alive by looking at recent industry events and incorporating them into training scenarios. We ensure they change every few months so that crew face new challenges to test their skills and knowledge."

## Slide selfie

On 8 September 2015 a British Airways Boeing 777-200ER suffered a well-publicised high-

pressure compressor failure on take-off from Las Vegas McCarran airport. An emergency evacuation was carried out and all passengers and crew escaped without major injury. But images quickly emerged of passengers carrying hand luggage – including large roller bags – off the aircraft; there were suggestions that a small number had paused to take selfies.

With the incident still under National Transportation Safety Bureau investigation, British Airways is unable to comment directly on the events of 8 September. However, Mark Mannering confirms that unpredictable or difficult passengers are factored into the training programme. “Our trainees are often called upon to act as customers in different evacuation scenarios but the main focus of the training comes back to ‘crowd control’.

“Our cabin crew are taught to make loud, positive and strong commands in order to take control of the situation and ensure that passengers are ‘flowing’ in the correct way. We can’t predict the reactions of all customers so our focus is on the reactions of our cabin crew and techniques they can adopt to ensure customers comply with their directions.”

## Simulation

Flight simulators are instantly familiar pieces of kit, but cabin simulators are equally important for cabin crew training. Taking as their basis retired aircraft or purpose-built ‘cabins’, they can be fixed or mounted on moving platforms.

Regulators may specify that cabin emergency evacuation training be performed across a spectrum of abnormal attitudes, simulating aircraft that have come to rest after an incident – an undercarriage collapse or ditching, for example. The level of realism achieved greatly influences the quality of training delivered, with audio-visual and other systems creating extremely convincing emergency scenarios.

Several companies produce cabin emergency evacuation trainers (CEETs) and the UK’s EDM is among the industry leaders. Its commercial products include bespoke door trainers, fixed-platform and motion-platform CEETs, and the Safety & Emergency Procedure Training Reality Engine (SEPTRE).

Airliner doors tend to be complex and, in some cases, surprisingly heavy items to operate, with nuances and features that vary between aircraft types. Training for regular day-to-day operation is therefore vital but training for emergency opening or jettison is potentially life saving.

EDM produces its door trainers to OEM drawings, including all the mechanisms found on the ‘live’ door and systems for simulating various levels of failure. Built to match the interiors and requirements of the customer airline, door trainers



WE TRAIN OUR CREW FOR DIFFERENT TYPES OF EVACUATION – PLANNED, UNPLANNED, WATER – AND A MULTITUDE OF REALISTIC SCENARIOS

Mark Mannering  
British Airways



## Emirates’ high-tech training

An Emirates spokesperson reveals details of the carrier’s emergency evacuation training. “Cabin emergency evacuation training forms an extremely significant portion of the seven-week training that all new Emirates cabin crew undertake as part of their overall training programme.

“After qualification they are given annual refresher safety, emergency and first aid training. Courses take place at the Emirates Aviation College (EAC) and comprise theoretical and practical components. They are delivered by highly qualified Emirates staff, many of them former cabin crew.

The EAC facility is equipped with advanced, full-motion aircraft simulators, including those for the Airbus A330, A340, A380 and Boeing 777, which make emergency scenarios for new cabin crew very realistic. The simulators also help cabin crew become familiar with the aircraft in a true-to-life environment.

To improve the training experience further, in October 2015 Emirates appointed Cubic Global Defense, a training solutions provider, to develop a virtual, game-based cabin crew training programme. Currently in development, it will use a combination of virtual learning content and ‘gamification’, delivered online and in classrooms, that will enable cabin crew to learn and practice the skills required to ensure the highest levels of safety.”



## ● Safety

Cabin crew training



EDM

### Ethiopian 737/757 hybrid

Ethiopian Airlines' CEET/SEPTRE is a hybrid system designed for its 737 and 757 trainees. While EDM offers modular CEETs manufactured in-house, it also has the capability to incorporate airframe sections into its equipment. The 737/757 is based on a 737 fuselage recovered from an aircraft retired after a long flying career.

A large 'blister' in the rear starboard area fairs the larger diameter of a 757 door into the 737 fuselage. An instructor station in the aft left side of the cabin includes an operator console for management of all the simulation systems and, although pre-programmed events are provided, instructors can intervene at any stage to increase difficulty, introduce events or stop the simulation.

The entire unit was built at EDM's facility, where Ethiopian representatives approved it before it was dismantled and moved by road and sea to Addis. Re-erected in Africa, it joined the Airbus A350, Boeing 767 and Bombardier Q400 door trainers that Ethiopian already had in service. In December 2015 EDM despatched a modular 777/787 hybrid CEET to Ethiopia, with reassembly due to begin in January. It will be mounted on a fixed platform.



EDM

*Testing of water-based safety and emergency procedures at The Emirates Aviation College.*



Emirates

can be as simple as a small section of 'fuselage' and interior either side of the door itself, or include a section of cabin containing seats, overhead bins, communications systems and even toilet cubicles. Overwing exit doors are also produced and all doors can be mounted at operational height for greater realism.

Including a door trainer in a CEET produces a versatile training aid capable of facilitating instruction in basic cabin and door procedures and generating comprehensive training in evacuation techniques. Mounted at aircraft height and combined with dedicated platforms, the CEET enables trainees to open overwing exits and egress passengers.

Equally importantly, CEET doors can be installed with emergency evacuation slides. Customers have the option of installing a pre-inflated slide that remains in extended position, employing slides that deploy as on the live aircraft or, where space in the training facility is restricted, fitting a projection system that produces a 'virtual slide' when students follow the correct deployment sequence. In all cases, EDM's system enables the simulation of a variety of faults and malfunctions.

Evacuation by slide has historically caused injuries among crew and passengers but it is minimised when correct procedures are followed. Passenger behaviour at the foot of the slide and after evacuation is also critical and BA's Mark Mannering notes: "Evacuation is only half the story – we also train our crew in their post-evacuation responsibilities. This includes keeping people safe once outside the aircraft."

Manchester-based EDM also builds its CEETs to OEM-supplied drawings and offers operators the possibility of cabin upgrades as their aircraft are updated, keeping simulation on a par with the fleet and again maximising training value. Mounting



Fire fighting skills tested at the Emirates Aviation College.



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a CEET on an electrically-driven motion platform adds yet another layer of realism but EDM raised simulation to another level in 2012, offering customers SEPTRE in combination with a CEET.

The system places a visual display at each cabin and door window, and installs a powerful audio system, delivering frighteningly convincing effects created with the assistance of a former BBC sound engineer. Each window monitor produces a separate image, so that looking from window to window occupants have the impression of looking across a vista.

Combining the 'view outside' with authentic sound, a fully equipped cabin interior and motion, creates a dynamic simulator capable of flooding the senses and emoting genuine reactions of fear and panic. Thus trainees are placed in a challenging environment for pre-incident, evacuation and post-incident training, but the CEET/SEPTRE also includes in-cabin crisis simulators for additional levels of complication.

Among them, a devious fire simulator emits smoke while a flashing red strobe realistically recreates a cabin fire. Trainees use simulated extinguishers to combat the problem, under whatever degree of stress the instructor should choose – they may be working under emergency cabin lighting in a smoke-filled cabin, tilted after an undercarriage collapse and full of screaming, panicking passengers. If they fail to fully extinguish

the fire it will 'smoulder', ready to flare up again later in the simulation.

Sales of EDMs combined CEET/SEPTRE had been entirely to Chinese airlines, until Ethiopian Airlines ordered its hybrid Boeing 737/757 system, which EDM installed at the carrier's Addis Ababa training facility in November last year. Uniquely, the Civil Aviation Authority of China specifies that cabin emergency evacuation training be carried out in a simulator capable of creating a 0.5g 'heave', which EDM's motion platform easily generates. The company's CEET/SEPTRE inevitably found favour in China therefore, but has now been selected by the African airline as it aims to establish a safety role model for the continent's carriers.

### Summary

Simulation is key to effective training in cabin emergency evacuation procedures and airlines recognise the importance of realistic recurrent training for crews who may never face a true emergency. But it is also important for the industry to observe events and passenger behaviour when incidents occur.

The unexpected, reckless behaviour of a few passengers in Las Vegas will surely be reflected in future training programmes as crews prepare to deal with the extraordinary phenomenon of the selfie-taking slide user.