

SURVIVAL . . .

authorities for evacuating a modern jet transport is 1min 30sec.

The two main methods of leaving the cabin in an emergency are through the emergency windows, which usually lead on to a wing, or by the doors, via a slide. Attractive as the first method would seem to a passenger sitting near the wing, it does have disadvantages. The exits are smaller than a normal door and, once on the wing, there is usually a big drop to the ground unless the undercarriage has been wiped off or is retracted. The best way of getting off a wing, if the flaps are down, is to sit on the trailing edge and slide over the flaps. At worst one could jump off the leading edge and risk a broken ankle; but even that is better than not being able to get out at all.

There are two main schools of thought on the best method of door exit. Some airlines use inflatable slides and others the non-inflatable type. Both kinds, generally speaking, have to be deployed manually. The inflatable slides have been shown to work well, although mishandling can give rise to serious problems, and even to non-availability—for instance, if the slide is inadvertently inflated before it is removed from its cover. BOAC uses only inflatable slides and the rapid evacuation from 707 G-ARWE at Heathrow recently, in which nearly 90 passengers used one slide in just over a minute, is ample testimony to the company's faith in the system.

On the other hand, BEA uses nothing but non-inflatable slides in its aircraft. These are simply nylon-type fabric chutes which are attached to the door-sill by the cabin crew, the free end being thrown out of the doorway. They appear to suffer from the big disadvantage that two people have then to climb down the slide, using it as a rope, in order to stand at the bottom and hold out the slide so that it can be used by succeeding passengers. This means some delay, inevitably, and it takes nerve to climb down a slide. The writer did it once, in the BEA training centre, and would not look forward to doing it again. Neither would he care to stand holding the bottom of a slide while the rest of the passengers came down. The natural compulsion would be to run as fast as possible away from the crippled aircraft—particularly if there was any fire about. In fact, this is exactly what happened when a slide was used in this way some years ago. The first two men out, who climbed down the slide, simply ran off when they saw flames nearby.

Proponents of this type of slide argue that the inflatable variety can suffer from mishandling before deployment, or can fail to inflate. The non-inflatable type is mechanically fool-proof, they say. At the moment, both types are capable of being burned although fire-resistant materials have been developed and may be incorporated, at a price, in future systems.

Whichever type of slide is used the passengers have to be briefed to use it, and cabin crew must be familiar enough with its operation to be able to deploy it in the dark. Two important points emerge here: are passengers sufficiently well briefed in ground evacuation techniques, and is cabin crew training taken far enough? Both BEA and BOAC have cabin-crew simulators for teaching emergency drills, and all cabin crew must be checked on each aircraft type at least once every year. Neither corporation, however, gives its instruction in smoke-filled cabin interiors, and neither of their cabin mock-ups is tiltable. KLM has just built a composite DC-8/DC-9 fuselage mock-up which can be tilted 15° and filled with smoke if necessary; this approach seems much more realistic than that used by many operators.

The costs of effective cabin crew training are inevitably high, but in many cases it is the cabin crew who alone are responsible for getting people out of the aircraft. Only five per cent of all cabin staff may need to use their knowledge in this respect, and then only once in their service life; but nobody knows which five per cent it will be or when they will have to act. This is all the more reason why they all should be properly trained in the first place and kept rigorously in trim during their flying careers. While conscientious chief stewards, pursers and flight crew usually check at least one if not all of the stewards and stewardesses on their emergency

drills at the start of each trip, this is virtually a theoretical check. Anyone can learn quickly enough where the emergency-light switches or CO₂ bottles are located; getting the equipment to work properly is another matter, and one which is probably not checked often enough in practice.

It would seem prudent to make all emergency equipment as automatic as possible or, if it must be used manually, simple to operate. Training and checking could be more realistic, and recruiting standards should be kept high. Time and time again cabin staff have shown themselves capable of the highest standards of efficiency and bravery in performing their emergency duties, but they must be supported by good equipment which leaves them more time to control the outflow of passengers and to make sure that none is left behind or trampled in the usually inevitable rush.

Often forgotten is the fact that any aircraft will have its complement of old and infirm, or very young, passengers who need encouragement or physical assistance. At the other end of the scale there are some passenger types who need restraining in an emergency. The cabin crew should be of a calibre which can cope with the whole range of temperaments. (One airline is said to be training its stewardesses to shout loudly and clearly—their instructions could not be heard during an actual emergency.)

Meanwhile the flying crew generally make their own way out. The captain's job varies, but usually consists of supervising the "ground" end of escape slides and marshalling passengers at a distance from the aircraft. People tend to wander away from accidents and can reach considerable distances before being "caught" by the airline, which is naturally trying to account for the fate of all occupants. This head-counting is much simplified if one crew member has the job of marshaller until the emergency services arrive.

All of this presupposes that the accident has occurred on land, simply because the trend in "survivable" accidents these days is towards their being on land. There are very few pre-meditated ditchings of modern jet aircraft, and this explains in part the looseness of the legal requirements for the carriage of liferafts. For example, on a North Sea crossing, unless it is up to Norway, no such rafts are needed, although virtually all aircraft carry lifejackets. In the event of any ditching the problems of impact forces and evacuation are compounded by the unnatural surroundings and the physical hazards of cold water. Even in Pacific waters, lifejackets are no supporters of life unless warmth can be induced somehow. By far the best way is to be able to board a raft and at least partially dry out. The problem then becomes one of location by search-and-rescue craft.

Unless emergency radio transmitters are provided, or the ditching is within sight of a populated coastline, the arrival of such craft is not always as rapid as might be imagined. In a recent maritime incident in the North Sea a passenger liner was abandoned at 6.30 a.m., but the first aircraft did not arrive overhead until 10.30 a.m. All the passengers survived their eventual six-hour wait because they had efficient liferafts.

The Future Concern is expressed regularly in Parliament and the Press about the safety aspects of the large-capacity aircraft which will be with us within the next two years. In fact the Boeing 747 will have more emergency exits per passenger than current jets, and the slides will be two-stream affairs enabling twice the number of people to be evacuated in the same time. There will be ten exits in all, five each side (two over-wing and three doors), giving two exits for each group of 75 passengers. Sill height at 15ft will be a problem—psychologically, a 20ft eye-height is disturbing—but who has time for phobias in an emergency? Seats will no doubt be designed to high impact-resistant standards, and innovations such as tape-recorded emergency briefings will be provided for.

It all points towards self-containment. However good the airport emergency services, and however well deployed, it can never be guaranteed that rescue will be available almost instantly. Aircraft must carry their own systems. With a little more refinement, and the development of "safe" fuels, there is no reason why the survival systems outlined in this article, and the cabin crews who have to operate them, should not be able to provide a much higher level of safety in any accident which can be termed "survivable."

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