

# Aviation terrorism – learning from history

Since its early beginnings, the aviation industry has been a target for acts of violence and terrorism, writes **Gunnar Kuepper**, but today the threat may appear to be more acute

**T**ODAY, THE AVIATION sector employs 127 million people world-wide, and accounts annually for revenues of US \$3.5 trillion, carrying 1.5 billion passengers and 28 million tons of cargo in 20,000 commercial aircraft. Aeroplanes and airports have been attacked, bombed, and their occupants have been subjected to despair and calamity.

The most common attacks in the aviation world are aeroplane hijackings. The first commandeered diversion of a civilian aircraft took place on February 21, 1931 in Peru. Since then, air piracy has become commonplace. In the 31 years from 1970 to 2001, more than 800 aircraft hijackings have occurred world-wide. In 115 of these hijackings, the attackers have been taken down by passengers

## Violent situations

Although many hijackings have ended peacefully, some commandeered planes have crashed on or off airport premises and some incidents have culminated in violent situations on the tarmac.

Under each of these extraordinary circumstances, emergency services, including police, fire-rescue, and EMS-Ambulances, have been the first to respond, and, more often than not, have served as the last line of defence when all else fails. Sometimes fire crews have been trapped in crossfire, as in the 1985 Egypt Air tragedy at the Malta airport. Another case of unprofessional police action occurred during the terrorist attack and hostage-taking at the Summer Olympics in Munich, Germany. In the late hours of September 5, 1972, attempts by ARFF crews to extinguish the flames and to rescue the Israeli hostages from burning helicopters at Fürstenfeldbrück Airfield were hampered, not only by shots fired by the Palestinian terrorists, but exacerbated by poorly trained police officers.

But there have also been stories of successful rescue missions, even under the most difficult hijacking circumstances. Fully trained, highly motivated, and well equipped special operations groups were able to make a difference in Entebbe,

Uganda on July 4, 1976, and in Mogadishu, Somalia on October 18, 1977.

On October 13, 1977 the Lufthansa Boeing 737, named “Landshut”, was seized, during a flight from Palma de Mallorca, Spain to Frankfurt, Germany. Four terrorists stormed the plane, with 86 passengers and a crew of five aboard, ordering the pilots to undertake a desperate journey through Rome, Larnaca, Beirut, Bahrain and Dubai. On October 16, the trip continued to Aden airport in Oman, where the pilot was shot, execution style. The next morning, the Boeing 737 took off again and flew to Mogadishu in Somalia. A contingent of 30 members, all from a special operations group (GSG 9) of the German Border Police followed the hijackers in their own separate plane. During the first night in Mogadishu, the team conducted a precise, and ultimately successful, rescue operation. Using diversionary audio and visual images in front of the aeroplane, they opened the over-wing hatches, and proceeded to toss ‘stun grenades’ inside the fuselage. They then ordered the hostages to stay down, and opened fire on the terrorists. Within four minutes, all terrorists were wounded or dead. Three hostages were injured, but none of the 90 hostages were killed.

## Broken promises

A prime example of a flawed mission is the activity of Egyptian forces in Malta on November 24, 1985. Three Palestinian terrorists from the Abu Nidal group seized Egypt Air Flight 648, a Boeing 737, on an evening flight from Athens to Cairo. In a subsequent mid-air gun battle with an Egypt sky-marshal, one hijacker was killed, while two flight attendants and the security guard were injured. The aircraft, with 96 occupants aboard, was forced to land for refuelling at Luqa airport on the Mediterranean Island of Malta. After hours of negotiations, the terrorists released 13 women, including the wounded flight attendants, in promised exchange for the right to refuel the plane.

When the Maltese government continued to

---

*Fire crews have been trapped in crossfire between the hostage takers and the security forces*

---



refuse fuelling, the terrorists began shooting passengers. Over a period of an hour, they shot five women in the head and dumped their bodies onto the tarmac. Miraculously, three survived their gunshot wounds. With the authorisation of the Maltese government the Egyptian commandos (Force 777) tried to storm the aircraft during the early evening. For forcible entry, the military used explosive devices, which started a fire. Amid the confusion of flames and smoke, the squadron engaged the terrorists in an hour-long shootout. In the subsequent carnage, resulting from the unintended blaze and the amateur gun battle,



Photo: Saad Khan / AFP / Getty Images

## 1999: Taliban commandos at a hijacked Indian plane that was allowed to land in Afghanistan

58 passengers and two of the six crew members were killed. Until September 11, 2001, this was one of the deadliest aircraft hijacking incidents in aviation history.

In countless other situations, hostage negotiators were able to bring a stand-off to a peaceful resolution. Since those incidents have been handled in an “uneventful” fashion, without bloodshed and carnage, they have not often been reported by the media. As such the important

work of negotiating professionals has rarely been adequately appreciated by the public.

Each hijacking situation requires a well co-ordinated response and the sharing of information at all stages of the event. Participating entities include, on the operational level law enforcement, fire/rescue, EMS, hospitals, air carrier, airport operator, and other authorities with proper jurisdiction (AHJ). Commonly, the lead agency in such cases will be the military/law enforcement/security agency designated by applicable law. For agencies that are used to individual approaches and classified operations, it is crucial and mandatory that they work with all other groups involved. The implementation of a joint command post and the use of unified command are not negotiable. Each organisation has to send a senior official to the command post to share information, to support the responsive action with resources and input, and to allow for the uninterrupted flow of communication.

Sometimes, the hijacking ends in a crash that is not even intended by the hijackers. On November 23, 1996, three hijackers took over Ethiopian Airlines flight 961 en route on a flight from Addis Ababa to Abidjan. They demanded to be flown to Australia. Despite the warnings of insufficient fuel, they forced the pilots to proceed. The aircraft ran out of fuel and crashed during an emergency water landing into the Indian Ocean, about 500 yards off the shore of the Comoros Islands. Of the 175 people aboard, only 47 survived.

## Bombings

Aeroplanes have often been bombed, leading to the destruction of countless lives. One of the earliest mid-air bombings took place on September 9, 1949, near the town of Sault Au Cochon in the province of Quebec, Canada. A bomb exploded in a forward baggage compartment of a Quebec Airways DC-3, and all 23 people aboard died.

Bombs have been placed on aeroplanes in the name of criminal activities, suicidal actions and acts of terrorism. On June 22, 1985, Air India Boeing 747, flight 182, was blown to pieces and crashed into the Atlantic Ocean off the coast of Ireland. All 329 people aboard died. The same fate befell PanAm flight 103, en route from London to New York – on December 21, 1988, a device exploded at 39,000 feet above the small town of Lockerbie in Scotland.

Between 1970 and 2001 there have been reports of more than 30 bombs on aeroplanes.

After September 11, 2001, the risk of another synchronised attack on commercial passenger planes seemed to be very remote. However, on August 24, 2004, at 2256 local time, bombs

exploded simultaneously on a Tupolev 154 with 46 people aboard and a Tupolev 134 aircraft with 43 occupants. Both planes had departed from Domodedovo Airport in Moscow, Russia. Nobody survived.

## Airports as targets

In addition to the threat posed to aircraft, airports have also become targets. With millions of passengers and tens of thousands of employees, these transportation hubs have become cities of their own. Airports have to face accidental or intentional threats that may include: Aeroplane crashes; shooting attacks; bomb threats and bombing attacks; fires or explosions, involving passenger terminals, hangars, fuel storage tanks; ground transportation accidents; disruptions to critical services (eg, electricity, communication); and disruption to utilities (eg, water, A/C, ventilation, heating, sewage, waste disposal).

In the 1970s and 1980s, terrorists assaulted people inside airport terminals, using automatic weapons and hand grenades.

Simultaneous attacks took place on December 27, 1985. One terrorist squad killed 15 people and injured 70 at Rome Airport in Italy. At the same time, terrorists went on a shooting spree at Vienna Airport in Austria. By the end of the attack, two people died and 39 were wounded.

On numerous occasions, bombs have exploded inside major passenger terminals. On August 6, 1974, Los Angeles International Airport was the subject of a bombing attack, which claimed the lives of two people and injured 17 others. Sixteen months later, on December 29, 1975, a powerful bomb inside LaGuardia Airport killed 11 people and injured 75 more.

Even today, most terrorist attacks involve bombs or some kind of explosive device. The impact of a bomb explosion is threefold: first, through the explosion wave which may cause buildings to collapse, secondly, from the hazard of flying debris, and finally, due to the consequences caused by fire, smoke and other airborne contamination.

The tremendous danger of flying debris, particularly glass, is often underestimated. In June of 1996, the Khobar Towers in Saudi Arabia became a target for a bombing attack. Twelve of the 19 US soldiers killed died as a result of glass-cut injuries.

## Mitigation strategies

Any effective mitigation strategy must be based on the results of comprehensive hazard and threat identification, careful impact analysis and risk assessment, cost-benefit studies, and operational experiences.

Mitigation strategies are part of the overall

terminal-building design. Bomb threat mitigation is a combination of: Architecture and technologies; construction and materials; policies, programmes and procedures; operations and tactics; and human factors.

The final goal is to provide a safe, sound, and secured terminal environment.

Passive bomb mitigation strategies for terminal buildings should focus on preventing building collapse, minimising hazardous flying debris, and reducing the risk of airborne contaminants, including fire, smoke, and suffocating dust. Window films are an example for a rather inexpensive, but effective way to significantly reduce the risk of flying glass fragments.

## Anxiety levels

Airports and aeroplanes, like many other facilities, from schools to office buildings, have been exposed to bomb threats. These cause chaos, confusion and significant delays, even in the best of circumstances. The impact this bears on business operations and the economy is considerable. Each evacuation or related law enforcement activity increases the anxiety level for the flying public.

In addition, as proven by the IRA in Northern Ireland and other terrorist organisations, bomb threats may also be used to study response capabilities, emergency procedures and law enforcement tactics.

Since most threats are communicated via telephone, each primary phone operator (emergency services, airport administration, airline, security desk, etc) must be prepared and trained in receiving calls of a threatening nature. Call operators need to have a checklist available that shows them what questions to ask, how to gather a maximum of information, and how to keep the caller on the line.

If bomb threats have been received or suspicious items have been found, an immediate decision has to be made; whether it is to evacuate first and then investigate, or investigate first and evacuate after the threat has been confirmed.

Each of these decisions has costly consequences, in terms of interruption of operations caused by evacuation or risk of liability as a consequence of an explosion. Therefore, every entity must have written policies and procedures that serve as guidelines for managers and operational staff. Those policies must be approved by the executive level, must involve legal council, and must entail co-ordination with the appropriate law enforcement agency.

The determination of the credibility of a bomb threat is often different in various environments. Risk assessment towards human actions, particularly the anticipation of terrorist attacks, is

not yet purely scientific, but involves guessing and a wide range of error. Different entities use different approaches and methods based on their knowledge, experience, culture and attitude. This may lead to conflicting outcomes, sometimes with interesting consequences. On October 5, 2004, a bomb threat was received for a Lufthansa Boeing 747, Flight LH686 with 347 people aboard en route from Frankfurt, Germany to Tel Aviv, Israel. German officials determined the threat as non-credible and allowed the flight to continue.

Israeli authorities, however, came to quite a different assessment. They sent two F-16 fighter planes to escort the aircraft, and the Lufthansa plane was “kindly” asked to make an unscheduled landing at Larnaca Airport in Cyprus. Security forces evacuated and searched the plane without any finding of explosives. After a few hours, the flight was able to proceed to Tel Aviv Airport. It can be assumed that the victims and families of Pan Am flight 103 and Air India would have also appreciated a thorough approach to the threat. In the cases of these mid-air bombings, vague but known warnings existed before the actual attack. Therefore, a joint methodology and a standardised approach towards threat assessment should be used in the global aviation industry.

Bomb threats against commercial airlines are still very common all over the world.

Airports need to have plans in place to handle the evacuation of an entire terminal. In recent cases, airports were prepared to provide proper service to arriving or departing passengers. On Sunday, September 14, 2003, seven phone calls alleged bombs inside the passenger terminal at Düsseldorf International airport, Germany. As a result, the entire building with three concourses was evacuated and closed for more than six hours. Thousands of passengers were left on the street or bussed to open fields. They were not provided with basic needs like water, sanitation, or food, and most were left without any information about the situation.

A similar situation occurred one year prior this at Los Angeles International (LAX), the world’s third-busiest airport.

## Shootings

This crisis took place on July 4, 2002, when a native middle-eastern individual started a shooting attack at the El Al check-in counter at Tom Bradley International Terminal in Los Angeles. He was able to kill two bystanders and injure three others before being shot himself by an Israeli security guard. During the assault, more than 10,000 travellers evacuated the building. Local police and rescue services had the situation

---

*A new breed of fanatics, operating without mercy, now aims for extensive destruction and maximum fatalities*

---

under control in minutes. However, due to the crime scene in the middle of the terminal and the possibility of explosive devices, the building was closed for hours and it wasn’t until the next day that normal operations could be resumed. Approximately 12,000 people, most of them international travellers, including many with limited English skills, were dumped onto the streets of the airport. The airport administration had no procedures, manpower, or even equipment – such as bullhorns – to provide the basic needs for evacuated/displaced people. In the initial chaos, many had left their hand-luggage, including passports, flight tickets, purses, and needed medication inside the terminal building.

While flight operations continued at the other seven terminals, those evacuated were not allowed to use the restaurants and seating areas inside these functioning terminals. According to US security rules, a flight ticket for the specific departure terminal is required to enter those concourses.

Particularly after the September 11, 2001 experience, airports and air carriers must be prepared to provide thousands of stranded passengers with support and services.

Appropriate evacuation is a major concern in the case of a suspicious vehicle. The vast majority of bombs and explosives have been delivered via automobiles. Some of these parked vehicles have brought down high-rise buildings (eg, the Federal building in Oklahoma City in 1995). Therefore distance and shielding is of the essence. A full size sedan can carry up to 1,000 pounds (450 kilos) of explosives in its trunk. The lethal air blast range is 125 feet (40 metres), the flying glass hazard zone is 1,800 feet (550 metres), which equals the minimum evacuation distance.

In the case of a small box van, the potential load goes up to 10,000 pounds (4,500 kilos) with a lethal blast range of 300 feet (90 metres). The flying glass hazard zone expands to 3,700 feet (1,100 metres), leading this to be the evacuation distance away from the suspected or existing bomb.

As a simple rule for evacuation, distance, and shielding: “If you see the bomb, the bomb sees you.”

If people are to be evacuated, it is crucial that the evacuation routes and assembly areas are safe and secured. The primary bomb, or a secondary device, may be intentionally placed at those sites. On Saturday, August 15, 1998 around 1430, the Ulster Television newsroom in Northern Ireland received a phone call claiming there was a bomb near the courthouse in the town of Omagh. Police and security forces moved people away from the courthouse and the adjacent Market Street.

At 1710 a bomb hidden in a trunk of a parked car exploded hundreds of yards away on Dublin Street, exactly where people had gathered at the police cordon. At least 29 people died and more than 200 were injured in the powerful blast.

This is a compelling example of why evacuation should never lead into a parking lot filled with unscreened cars. Vehicles, large dumpsters, maintenance shacks, and other facilities near an assembly point should be searched for explosives before leading crowds into the area.

## Explosive detection

Until most recently, it was very difficult to detect explosives outside of the thorough screening of luggage, particularly at airports. But emerging technologies now allow for the detection of tiny particles of explosives carried by humans. So called "trace detection portals" have been installed by the US Transportation Security Administration. Since 2004, the equipment is in service at a rail station in Maryland, in cities like Tampa and San Diego and at JFK International Airport in New York. After entering the portal, small jets of air blow off any particles someone handling or carrying a bomb might still have on them. The air is sucked in and analysed within 15 seconds by the machine, while the passenger's photograph is taken. On the other hand, the portals are very sensitive. False positives have been triggered by fertiliser, nitro-glycerine, and even by people taking medication for heart conditions. Traces of the medication have come out through the pores in the skin, and have been detected by the device.

As with all new technologies, a significant amount of research and fine tuning is still needed, if we wish to reach a workable solution for airport security. These portals are effective enough, however, that we may soon see them being installed at all the major transportation hubs, which facilitate the travel and commute of millions of people, via air, railroads, highways, and waterways, every month.

One of the most successful and mobile explosive detection systems is the use of dogs. Access to certified explosive or bomb sniffing dogs is critical for airport operations, in determining whether or not an area is clear of explosives. In today's world, those dogs and their handlers need to be highly trained (using real explosives) and well-certified, particularly in the highly visible aviation industry.

## Response

Emergency crews and airport employees are the people who arrive on scene within minutes of an aviation emergency. They rush in to help, to

evacuate, to rescue survivors from further harm and to prevent more casualties, and to extricate and free those trapped under debris or in the line of fire. These tasks are often undertaken in extremely hazardous environments, under the threat of secondary explosive devices, or amid the collapse of structurally damaged buildings.

## Last line of defence

Fresh in our minds is September 11, 2001, when four major passenger jets were hijacked, and two of them were deliberately crashed into the towers of the New York World Trade Center. Both 110-storey buildings pancaked within an hour after impact, killing more than 2,800 people, including 343 fire personnel, as well as numerous emergency workers and officers from the New York Police Department and the New York/New Jersey Port Authority. Once again, when the intelligence community and other groups tasked with aviation security failed, emergency services became the last line of defence.

Nevertheless, the events of September 11,

2001 have given evidence to the paradigm shift of terrorism in the modern world. Rather surprisingly for the public, the move was long anticipated by counter-terrorism professionals.

A new breed of fanatics, operating without mercy, now aims for extensive destruction and maximum fatalities. Frightening though it may be, young people who are indoctrinated into terrorist groups are often all too eager to kill themselves and others.

Air travel is still by far the safest method of transport. However, to combat terrorism and avoid tragedies like the September 11, 2001 attack, a comprehensive and well co-ordinated approach is needed. This includes skilled intelligence, trained and motivated security staff, technologies for explosives and weapons detection, screening and profiling of passengers and employees, and effective incident response and crisis management capacities. Security standards and procedures have to be developed that are implemented, monitored and enforced throughout the world.

CRJ

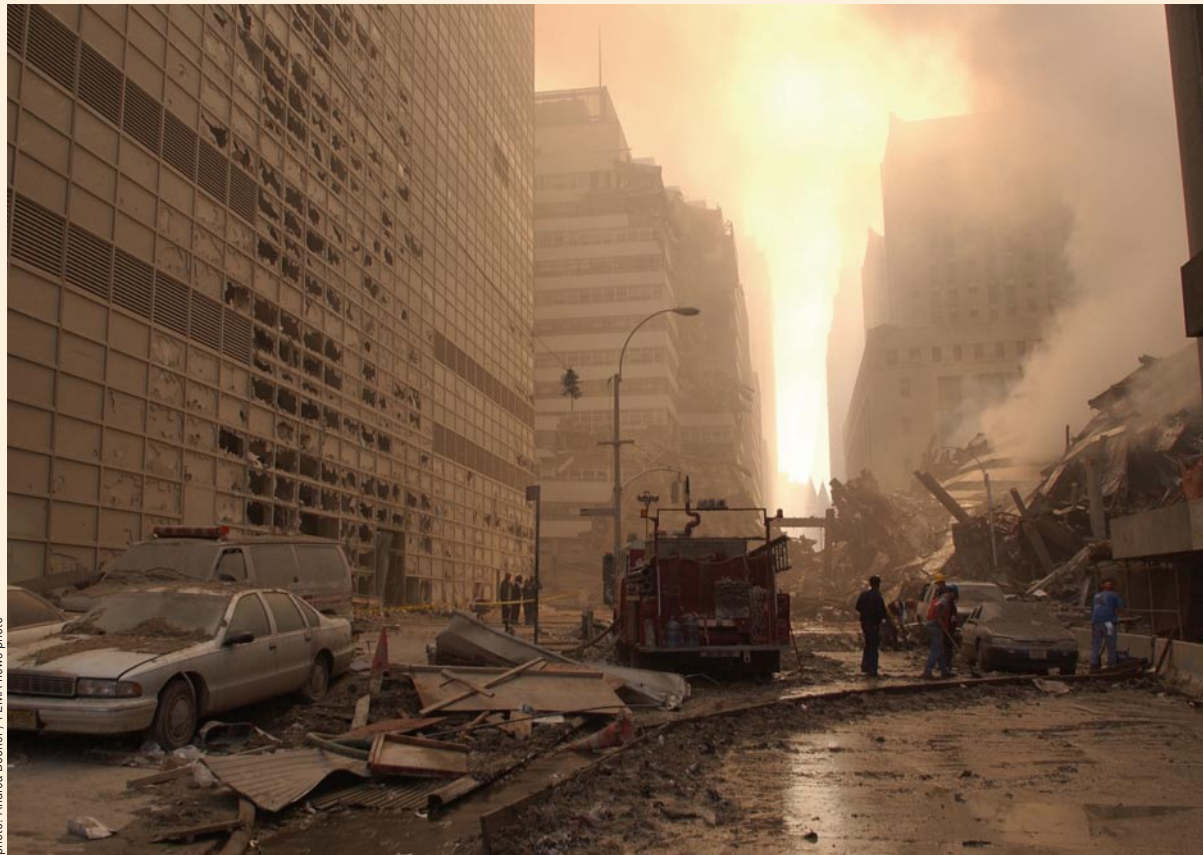


photo: Andrea Boether / FEMA news photo

**The realisation of just how devastating aviation terrorist incidents can be was confirmed on September 11, 2001 in New York**

### Author

**Gunnar J. Kuepper** is Chief of Operations with Emergency & Disaster Management, Inc. (EDM) in Los Angeles. EDM ([www.edmus.info](http://www.edmus.info)) provides consulting, training and advice to governmental, non-profit, and private institutions world-wide. Its focus is on Comprehensive Emergency Management/Business Continuity Programmes and Preparedness and Response Procedures for Terrorism.