

BEHIND A LOCKED DOOR



By Michael R. Grüniger
and Capt. Carl C. Norgren
of Great Circle Services AG (GCS)

This topic is very emotional. This topic is potentially controversial. This topic is certainly difficult. Do security measures lower the level of safety in civil aviation?

Security has become a major concern. Newspapers constantly remind their readers of security risks to civil aviation and human civilization in general.

There is a wide debate outside civil aviation, particularly in circles interested in politics, psychology and philosophy, on the reasons for and mechanisms of the current-day security threats and associated measures. This column is not the place to discuss these issues, but to consider the repercussions security measures have or might still have on aviation safety.

Two topics emerge: the importance of flight planning and the situation of aircraft equipped with a reinforced lockable flight crew compartment door.

Out of Sight, Out of Mind

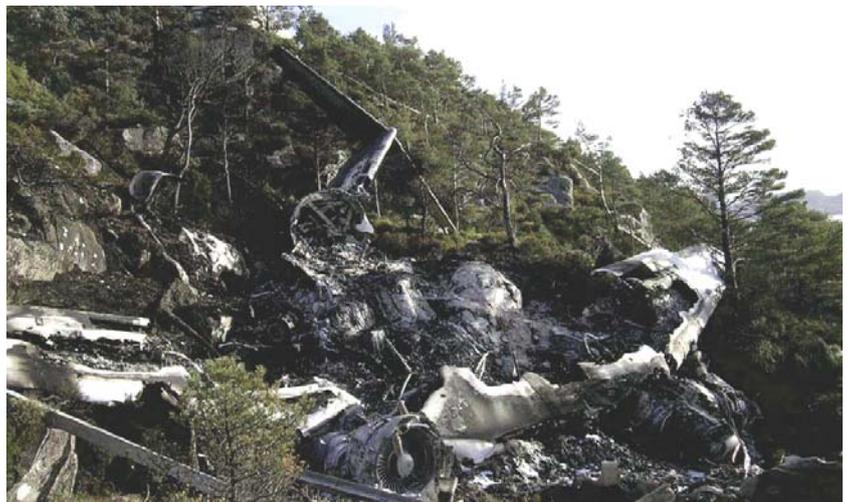
Searching the internet for airliner shoot downs quickly presents a list longer than imagined.

CONTROVERSY

It's worth asking:
do security
measures
sometimes lower
safety levels?

MH17, shot down on July 17, 2014, over the territory of Ukraine is but the last shoot down in a long series.

The first such incident dates back to the 1930s.



Wikipedia describes the incident as follows: "Believed to be the first commercial passenger plane destroyed by hostile forces. On August 24, 1938 - during the Second Sino-Japanese War - a DC-2 (the Kweilin), jointly operated by China National Aviation Corporation (CNAC) and Pan American, carrying 18 passengers and crew, was forced down by Japanese aircraft just north of Hong Kong in Chinese territory. 15 people were killed when the Kweilin, which made an emergency water landing to avoid the hostile attack, was strafed by the Japanese and sunk in a river. [...] It was later believed to be an assassination attempt on Chinese President Sun Yat-sen's only son, Sun Fo, who was thought to be aboard the flight but was not."

While airliners transport a wide section of people, business or corporate aviation operators often transport VIPs. Such VIPs may be exposed to security risks higher than to the risks airline passengers might be exposed to. It is therefore even more important for such operators to consider security risks.

The IS-BAO standard requires operators to establish, maintain and carry out a security programme that is proportional to the threat against the operator.

Besides preventing unauthorized access to and tampering with the aircraft, the operator is required to analyze the threats by actively gathering information on the area of operation. This includes security information on

the airports to be used and the route to be flown.

Security information and security risk analysis are part of the flight planning process. No doubt that after a careful threat assessment, the flight planner will avoid planning routes overflying risky territories. The fate of MH17 drastically demonstrates the need to stay clear of areas of trouble.

Sometimes it is hard to imagine that things happening on the ground might affect an aircraft flying at high altitudes. Is flying high above the clouds not synonymous with unbounded freedom? Unfortunately, today's weapon systems, utilized by both regular and irregular fighters, are able to shoot down aircraft at any altitude. Out of sight, out of mind is a dangerous recipe.

Avoiding conflict zones leads to longer flight paths, increasing duty times and sometimes requiring additional fuel stops. It also leads to increased traffic congestion in the airspace surrounding the conflict zone. These risks to aviation safety may be small compared to the security gain.

However we should not forget that aircraft have also been shot down which were not crossing a hostile conflict zone. In 1988 a warship, the USS Vincennes, mistook a civilian airliner for a fighter aircraft attacking. Iran Air flight 655, an Airbus A300, was in Iranian airspace on a flight from Bandar Abbas to Dubai when it was shot down with the loss of all 290 souls on-board. In 2001 the Ukrainian military accidentally shot down Siberian Airlines Flight 1812, a Tu-154 en-route from Tel Aviv to Novosibirsk with the loss of all 78 persons on-board. The anti-aircraft missile had been fired during an exercise and had failed to hit the intended target drone, instead locked-in on the civilian airliner at 36'000 ft. These aircraft were flying along published civilian airways under ATC control with functioning transponders clearly identifying them as civilian aircraft.

Avoiding conflict areas will reduce the risk of accidental shoot-downs, but will not eliminate it.

Trapped by a locked door

After 9/11 the need for securing the flight deck from unauthorized access became a key focus of aviation security measures.

First the FAA, then European state regulators and today the European Commission (ORO.SEC.100.A and ORO.SEC.100.H) require all passenger-carrying airplanes of a maximum certificated take-off mass exceeding 45 500 kg, or with a maximum operational passenger seating configuration of more than 60 engaged in the commercial transportation of passengers, to be equipped with an approved flight crew compartment door that is capable of being locked and unlocked from either pilot's station and designed to meet the applicable airworthiness requirements.

Some business aircraft are also equipped with such doors.

On October 10, 2006, a BAE 146-200 (a type also used as business aircraft) ran off the runway at Stord Airport (ENSO) in Norway. OY-CRG, operated by Atlantic Airways, plunged down a steep slope at the end of the runway. The aircraft sustained considerable damage and caught fire immediately. The accident report continues stating that four people died and six were seriously injured.

The accident was caused by a failure of the lift spoilers to deploy and insufficient braking effectiveness. The position of the aircraft lying on fire on a steep slope made evacuation difficult. The floor of the cabin was at a gradient. Thus, the passengers had to grab hold of the seats in order to climb up towards the rear of the aircraft. The front cabin doors were jammed or leading into the blaze. Only the left hand aft cabin door was available for evacuating the cabin.

The pilots escaped via the cockpit window.

The purser and a passenger in the front part of the cabin could not climb up through the cabin to reach the aft door. They attempted to escape via the cockpit door. The pilot tried to open the door from within the cockpit.

The reinforced door would not open. The cockpit door was blocked as a consequence of fuselage deformations.

Fire fighters found these two persons dead in the cabin, behind the reinforced cockpit door, which prevented evacuation via the cockpit.

Although most business aircraft are not equipped with such doors, the case still bears some lessons for business aircraft operators. Mainly to consider freedom of evacuation paths and making sure such evacuation paths remain unobstructed.

What also needs to be kept in mind when equipping an aircraft with a secure, bullet-proof flight deck door is the risk of the flight deck crew intentional committing an act of sabotage. There are a number of documented suicides by flight crew members (Royal Air Maroc flight 630 in 1994, SilkAir flight 185 in 1997, Egypt Air flight 990 in 1999 and most recently LAM Mozambique Airlines flight 470 in 2013). For a crew member intending to commit suicide or wanting to hijack the aircraft, a secure flight compartment door ensures he can carry



out his actions undisturbed once the other flight deck occupant has left the flight deck. Probably a secure flight deck door would have helped the hijackers of United Airlines flight 93 in 2001 to keep out the passengers who foiled their attempt to use the B757 in the 9/11 attacks by storming the flight deck and overwhelming the hijackers.

As always in aviation there is no absolute security and no absolute safety.

Security measures have to be evaluated based on their benefits and risks. When deciding on security measures their possible negative safety implications must be taken into account and mitigated as far as possible or at least as far as practicable.



Michael R. Grüniger is Managing Director and Capt. Carl C. Norgren is Senior Aviation Consultant of Great Circle Services (GCS) Safety Solutions. GCS assists in the whole range of planning and management issues, offering customized solutions to strengthen the position of a business in the aviation market. Its services include training and auditing (IS-BAO, IOSA), consultancy, manual development and process engineering. GCS can be reached at www.gcs-safety.com and +41-41 460 46 60. The column Safety Sense appears regularly in BART International.

TRAGIC
In the crash of OY-CRG in Norway in 2006, a reinforced cockpit door prevented two people from escaping.