

MALAYSIAN AIRLINES FLIGHT MH370.

*Four weeks have elapsed since the 'loss' of MH 370 and one of the greatest mysteries of the modern age continues to fascinate people around the globe, perplex aviation industry professionals and traumatise the families of the passengers and crew on board. Everybody seems to have their theory as, after all, airliners simply do not just fall out of the sky. Whilst this incident may indeed turn out to be a failure of the aircraft itself, or have been instigated due to a fire as a result of goods carried in air cargo, **Philip Baum** evaluates the viability of each of the criminal acts of interference that might have brought about the disappearance of MH370 and considers the security lessons already learned.*

A "DELIBERATE ACT" BUT HOW, BY WHOM, AND WHY?

Whilst the world ponders how a Boeing 777 can simply disappear without a trace and remain undetected for a month and the industry rightly calls for the better tracking of aircraft, the real challenge is in determining what set of circumstances resulted in the loss of MH370 in the first place. And, with a vacuum created by the absence of any wreckage, there has been an abundance of speculation ranging, in terms of criminal acts, from pilot suicide to terrorism and from cyber attack to the actions of an unruly passenger or stowaway. The problem is that all the theories are possibilities and whilst some are highly improbable, the

reality is that losing a Boeing 777 for a month is, in itself, bordering on the impossible...but it has happened.

The speculation must be agonising for the families and friends of the passengers and crew on board the ill-fated flight as they cling on to that faintest of possibilities that their loved ones may indeed be alive and that, whilst the multi-national search goes on for the aircraft in the depths of the Indian Ocean, the aircraft has miraculously landed somewhere. The speculation has called into question the integrity of crewmembers who, rather than being the villains of the piece, may have actually been performing

heroic acts as they desperately tried to retain control of the aircraft, making the disappearance all the more agonising for their families as their personal lives are picked apart in the full glare of the world's media. But such is the bizarre nature of this incident, we have little alternative but to speculate.

So, given the fact that the Malaysian Prime Minister confirmed one week after the disappearance that the loss of MH370 was almost certainly a "deliberate act", as opposed to a mechanical or structural malfunction, what could have happened? First of all, we must accept that a 'deliberate act' does not necessarily equate to a

'criminal act'. Many, including Billie Vincent, the former Director of the FAA Office of Civil Aviation Security, have quite rightly postulated that the crew may well have been dealing with a fire on board and have been shutting down systems, including the transponder, in an attempt to prevent the fire spreading before being overcome by fumes themselves, resulting in the aircraft continuing to fly until its fuel had run out.

Writing on Green Light's LinkedIn group (Airline and Airport AVSEC Network), Vincent suggests that the "scenario begins with the eruption of hazardous materials within the cargo hold - either improperly packaged or illegally shipped - or both. This eruption causes a fire in the cargo hold; the fire then progressively and serially destroys the airplane's communications systems; the toxic fumes quickly rupture into the passenger cabin, disabling and killing the passengers; the toxic fumes and smoke then (or simultaneously) fill the cockpit, disabling one of the cockpit crew as the other crew member, while probably impaired physically and mentally, manages to get his oxygen mask on and then attempts to turn the aircraft back to Kuala Lumpur before also

becoming disabled. MH370 then goes into a climb to FL450 (because of the inability of the impaired crewmember(s) to clearly see and set the controls for a return to Kuala Lumpur). The aircraft becomes unstable and 'stalls' at FL450 (above its certified operating ceiling) and descends back to a lower altitude (one report says 23,000 and another says 29,000) before once again becoming stabilised on a new course. At some point the surviving individual(s) on the airplane may have temporarily regained consciousness before once again succumbing to either a loss of oxygen or the remaining toxic fumes. The airplane then continues flying until it consumes all of its fuel and crashes - most likely into the ocean as there has been no report of any Emergency Locator Transmitter (ELT) signal (which can be received by satellite if the crash were on land)."

East Turkestan Islamic Movement

In terms of criminal acts, terrorism, whilst a possibility, is somewhat unlikely unless it was the action of a lone wolf. By now we would have expected at least one of the governments involved in the investigation to have uncovered some link with any organised group.

Aside from the previously unheard of Chinese Martyrs Brigade, no other group has claimed responsibility for the action and there does not seem to be a 'natural' perpetrator of a deliberate terrorist attack against a Malaysian airliner operating a flight to China.

That said, on a training course I delivered in Switzerland the week before the loss of MH370, I gave the class an exercise in which they had to evaluate the potential for certain groups to target aviation. The aim was to encourage aviation security personnel to consider five groups, and causes, outside their comfort zone - only some of which are currently active and branded as terrorist organisations. Along with Boko Haram, the FARC, Femen, and Meibion Glyndwr (the latter two included in order to encourage delegates to think 'outside the box'), I asked them to consider the East Turkestan Islamic Movement (ETIM); most of the delegates had never heard of the group despite the fact that it is believed to be behind a number of attacks against civil aviation.

On 7th March 2008, coincidentally (one presumes) almost six years to the day before the loss of MH370, Guzalnur Turdi allegedly attempted



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to bring about the destruction of a China Southern (MH370 was also a code share flight with China Southern) flight en route from Urumqi, in Xinjiang Province, to Beijing. Her suicidal act involved igniting gasoline which she had infiltrated onto the aircraft in fizzy drinks cans. Turdi, travelling on a Pakistani passport, had doused paper in the over-wing toilets (hence close to fuel tanks) with the gasoline; alert crew, detecting the strange odour, overpowered her with the assistance of a sky marshal before an almost certain conflagration was initiated.

In 2012, a 'team' of six ethnic Uighurs allegedly attempted to seize control of a Tianjin Airlines flight operating from Hotan to Urumqi; two were killed when passengers and crew overpowered the hijackers, who had smuggled explosives on board concealed in the crutches of one of the men feigning to be disabled. The other four were later sentenced to death.

There are a number of similarities between the two incidents. Both were Chinese domestic flights; both involved infiltrating prohibited items on board using innovative means; and both flights were saved by the presence of police or sky marshals on board. It is also believed that ETIM, or at least the cause ETIM is fighting for (independence for Xinjiang), was behind the attacks.

As a group in Switzerland, we discussed the fact that if ETIM wished to garner more international recognition, it would need to attack an international flight. Imagine, we contemplated, the targeting of a flight departing from Hong Kong. Would the group remain so unknown?

And so here we are having to contemplate the fact that the destruction of a Malaysian Airlines flight might have been caused by terrorism. Why Malaysia? After all, it is an Islamic state and those behind the fight for the independence of Xinjiang from China are Muslim. The answer could lie in the fact that Malaysia has been denounced by certain members of the international community for forcibly deporting back to China, on New Year's Eve 2012, six ethnic Uighurs who had claimed asylum in Malaysia having been found to be carrying forged passports. A further 11 had been deported to China in 2011.

So could the targeting of a Malaysian flight operating to China be seen as an attack against China and an act of retribution against Malaysia? Only time will tell. What we do know is that ETIM is becoming increasingly militant and is spreading its wings. On 1st March 2014, the group is believed to be behind an attack in Kunming in which 29 people were killed and more than 130 injured when a group of men attacked people, armed only with knives.

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But, if it was ETIM, why have they not claimed responsibility? We must remember that the objective of modern-day terrorism of the al-Qaeda (AQ) brand is to create a climate of fear and alter our daily lives rather than to make specific demands in the way that the groups of the 1960s and 70s did. Previous attacks against aviation have not always been accompanied by a claim of responsibility; take Pan Am flight 103 over Lockerbie (where the plot's author is still debateable) and Air India flight 182 off the coast of Ireland as examples. Part of the significance of the attacks of 11th September 2001 was the media spectacle created...the endlessly repeated footage of aircraft flying into buildings. Perhaps, once again, we are playing our roles in a script carefully drafted by a media-savvy branch of AQ? In the same way that the post-9/11 media debate was not about the AQ agenda per se, and with their penchant for the spectacular, the ceaseless news reports of the missing aircraft, the angst of the family members, the wild speculation, the poor communication and the fallibility of the aviation security system, these may just be the sort of headlines they are aiming for?

When it was announced that the search for MH370 was being conducted in two areas – one in the Indian Ocean and the other on a northern air corridor from Kazakhstan/Turkmenistan to northern Thailand - the possibility that the aircraft had been hijacked by ETIM and flown into Chinese air space, roughly in the direction of Xinjiang Province, and towards the multi-national area considered by some to be “East Turkestan” became a distinct possibility. Assuming that the aircraft did, in fact, land in the Indian Ocean, that scenario has become less likely.

Then again, could an aircraft land somewhere undetected and could the passengers and crew be taken hostage? Well it has happened before in Colombia, albeit using a Fokker 50



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aircraft rather than a B-777. On 12th April 1999 an Avianca flight, operating a domestic route out of Bogota, was hijacked by members of the ELN and flown to a jungle landing strip where passengers were taken off the aircraft and put onto boats which took them up the Magdalena River. Some of the hostages were not released until 19 months later.

And flying undetected? Well, you can if you want to but just not for too long. In one of the most famous cases in aviation security history, Israeli commandos managed to rescue the hostages taken when an Air France flight was hijacked to Entebbe in 1976. Avoiding radar detection and bypassing some 'hostile' countries, the legendary mission (which has been turned into at least three films) resulted in aircraft landing at an international airport in Uganda undetected in the middle of the night having also refuelled en route. But that was 1976.

The lone wolf scenario still remains viable and a struggle for control of the aircraft may well have taken place on the flight deck. We may never know. Even if the black box recorder is recovered,

whilst we should see evidence of what actions the crew performed from an avionics perspective, we may not know the conversations which actually took place as the recording loop for the cockpit voice recorder is far shorter than the possible seven hours which the aircraft allegedly flew before ending its flight in the southern Indian Ocean. We may simply have recorded silence.

Aircrew Mental Health

If there was a deliberate criminal act performed on the flight deck of MH370, who might have perpetrated it?

An unruly passenger grabbing the controls is unlikely given that it does not appear that we are dealing with an immediate crash scenario where the aircraft was forced into a dive into the South China Sea. Apart from anything else, the transponder would not have been turned off.

One could use that as an argument against pilot suicide as well...unless, of course, the plan was to try to ensure that no wreckage would be found and the cause of the disappearance never determined? Where better to do that than by ultimately ditching



On 17th February 2014, the First Officer, Hailemedehin Abera Tagegn, of an Ethiopian Airlines plane flying from Addis Ababa to Rome hijacked his own aircraft to Geneva.

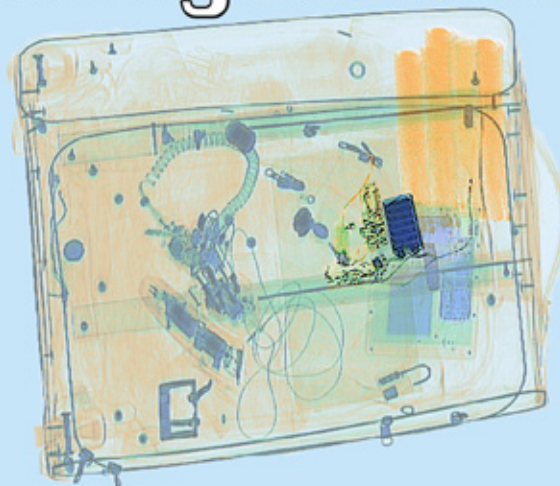
the aircraft thousands of miles away from its last known location, perhaps, unaware of the tracking capabilities of military radar, in the most remote area of planet Earth, more than three hours flying time from Australia - being the nearest land mass - and on a course for Antarctica?

A pilot can certainly hijack their own aircraft. In February this year, the First Officer of an Ethiopian Airlines flight en route from Addis Ababa to

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“...one of the most significant concerns about the knee-jerk reaction to install reinforced flight deck doors in the aftermath of the 9/11 attacks is that, whilst it may keep the bad guys out of the cockpit, it can also keep the good guys out too...”

Rome decided to hijack his flight to Geneva; he waited for the Captain to exit the flight deck to use the toilets and then locked himself in the cockpit and continued to fly the aircraft to Switzerland where he claimed asylum. But then why turn off the transponder?

One of the most significant concerns about the knee-jerk reaction to install reinforced flight deck doors in the aftermath of the 9/11 attacks is that, whilst it may keep the bad guys out of the cockpit, it can also keep the good guys out too. Once a hijacker is ensconced in the flight deck alone, the door can be bolted to ensure that nobody gains access. This worked to the industry's benefit when a JetBlue pilot, Jason Dowd, locked his colleague, Clayton Osbon, outside the flight deck whilst he was experiencing mental health problems. On the other hand, the aforementioned Ethiopian Airlines First Officer found the door aided his plan.

Instances of pilot suicide are, fortunately, rare. There were, however, three significant examples in the 1990s. On 21st August 1994, Capt. Younes

Khayati, after a lover's tiff with his female First Officer, crashed his Royal Air Maroc aircraft killing all on board. On 19th December 1997, Capt. Tsu, who had recently been demoted and was facing financial problems, is held responsible for the loss of a SilkAir flight. And, on 31st October 1999, the U.S. National Transportation Safety Board determined that the loss of an Egyptair flight en route from New York to Cairo was due to the actions of Capt. al Batouti, albeit that the Egyptian authorities reject this finding. Most recently, on 29th November 2013, Capt. Hermino dos Santos Fernandes crashed the Mozambique Airlines aircraft he was piloting in Namibia; all souls on board were lost.

A pilot can certainly disable the transponder and would already be inside the flight deck. As in the case of the recent Ethiopian Airlines incident, it would just be a case of waiting until the other pilot exited the flight deck for a routine break. The loss of the aircraft at that critical moment where control was being handed over from Malaysian ATC to Vietnamese ATC adds to the credence that a pilot may have been intentionally diverting the aircraft for nefarious means. Adding to the mix the Captain's somewhat bizarre YouTube clip which he loaded up describing how to tune an air conditioning unit to make it more economical (see http://www.youtube.com/watch?v=Qykj3FeG-p4&list=UUm6f3-wcpgLhxUR_ONPfoJA), the very nature of the subject he discusses will, no doubt, conjure up far more scenarios as to what might have happened on board and how passengers might have been controlled). Reports of his wife and children leaving the family home the day before the flight went missing, pictures of him wearing a T-shirt

saying 'Democracy is Dead' and his having attended the trial of Malaysian Opposition Leader Anwar Ibrahim, who was a personal friend and of whom he was an ardent supporter, only hours before the flight's departure could not be regarded as baseline behaviour or circumstances for a Captain just about to operate an international flight.

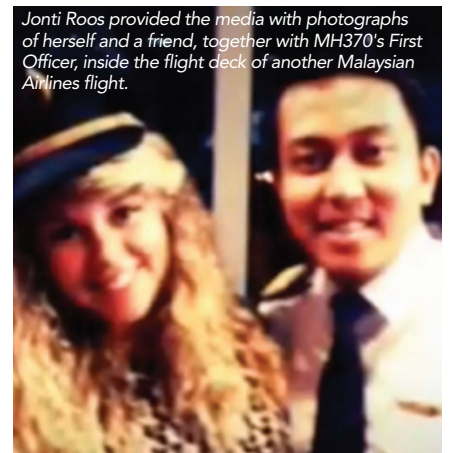
“...on 29th November 2013, Capt. Hermino dos Santos Fernandes crashed the Mozambique Airlines aircraft he was piloting in Namibia; all souls on board were lost...”

Cockpit Doors

Whilst I am loathe to criticise a pilot who is currently missing and, we must presume, innocent, the images that have appeared of MH370's First Officer in the media do little to enhance confidence in his respect of Malaysian Airlines own internal procedures. Jonti Roos, a South African girl, has provided the media with photographs of herself and a friend inside the flight deck of a Malaysian Airlines flight en route from Phuket to Kuala Lumpur; she claims that the pilots invited them into the cockpit for the entire flight, including take-off and landing, having seen them queuing up to board. As it happens, as a passionate believer in behavioural analysis and common sense security, I have no problem with pilots inviting guests to visit them in the cockpit. Quite the opposite; I think the fact that we can no longer take our kids to visit the Captain just demonstrates that we have no faith in our crews to make intelligent decisions and, yet



Captain Zaharie Ahmad Shah's YouTube clip in which he describes how to tune an air conditioning unit to make it more economical.



Jonti Roos provided the media with photographs of herself and a friend, together with MH370's First Officer, inside the flight deck of another Malaysian Airlines flight.



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On 29th November 2013, Capt. Hermino dos Santos Fernandes crashed the Mozambique Airlines aircraft he was piloting in Namibia.

again, allows the enemy another mini success in their attempts to control our daily lives. That said, we can't tolerate flagrant disregard of company rules.

The only time that hijackers have seized control of an aircraft, neutralised the flight deck crew and continued to fly the aircraft was on 11th September 2001...four times over. It was that event which brought about the decision to deploy the enhanced flight deck door – a lockable, bullet proof protective shield which could, allegedly, prevent a hijacker gaining access to the cockpit. However, as with X-ray technology for screening baggage, this is actually far more about deterrence than being an effective

security solution. Cockpit doors open numerous times on long haul flights and aircrew are notoriously complacent about adhering to the guidelines for operating them. The advice is that the door should be open for no more than three seconds and then only after the cabin has been checked to ensure that all passengers are seated. In the real world this doesn't happen.

Both Indian Airlines flight IC 814 (24th December 1999) and Turkish Airlines flight 1476 (3rd October 2006) were hijacked when their cockpit doors were opened in order for their respective flight attendants to give the pilots coffee shortly after take-off.



The crew of MH370 undergo screening at Kuala Lumpur International Airport on 7th March 2014.

Stowaways & Insiders

But what if the aircraft had been hijacked by somebody who was not on the flight manifest? Let's not forget the stowaway. This is a subject that I have spoken about at many symposia in recent months, in part because the body of a young man from Mozambique fell out of the wheel well of an aircraft and landed very close to my own office in the leafy London suburb of East Sheen when the aircraft's landing gear was lowered as it prepared to land at London Heathrow on 9th September 2012! The incident was one a series of worldwide incidents which has demonstrated the porous nature of airport perimeter security. Whilst most such stowaways have clambered into wheel wells, some have secreted themselves on board aircraft, often disguised as airport staff.

On 7th July 2012, two stowaways managed to penetrate the perimeter at Iceland's Keflavik International Airport and then, dressed as airport staff, board an Icelandair aircraft; they were found by alert crewmembers prior to departure. The same cannot be said in the case of a China Airlines flight which landed in San Francisco on 22nd October 2012; a passenger from Shanghai had flown from Shanghai to Taipei and on to the United States, where he claimed asylum, having boarded the aircraft wearing a cleaner's uniform and avoided detection in Taipei by concealing himself in an electrical compartment on board. Could the person who took control of MH370 have done likewise? We have to consider the possibility, especially given that the ACARS system was turned off and that this could have been done from the avionics bay, accessible from the aircraft's cabin and which is rarely searched (although normally locked) before flight departure.

The industry has long been concerned about the 'insider threat'. At almost every major international airport in the world, criminal activity of one type or another takes place in what are supposed to be sterile zones. It is certainly a possibility that, in an airport the size of Kuala Lumpur International Airport, individuals, with or without the knowledge of the crew of MH370, and with or without technical knowledge as to how to disable an aircraft's communication systems, could have managed to secrete themselves on board. And, if the quality of staff

screening is anything like the appalling standards demonstrated online (<http://media.theage.com.au/news/world-news/mh370-pilots-boarding-5251230.html>), then they could quite easily be armed as well.

Passenger Screening

All the passengers have been cleared of any involvement. The spotlight certainly initially fell on those found to be holding forged documents and the fact that two of those were Iranian nationals didn't help. Sadly, it is all too easy to board a flight with incorrect travel documentation as such checks are usually left to airlines which, whilst keen to avoid fines by transporting incorrectly documented passengers, are not connected to international databases of lost or stolen passports. Immigration authorities, who can effect such checks, are less concerned about departing passengers than incoming ones as they see their role as border protection rather than aviation security. Whilst INTERPOL may have a database of 40 million reported lost and stolen passports, there are plenty more that are unreported.

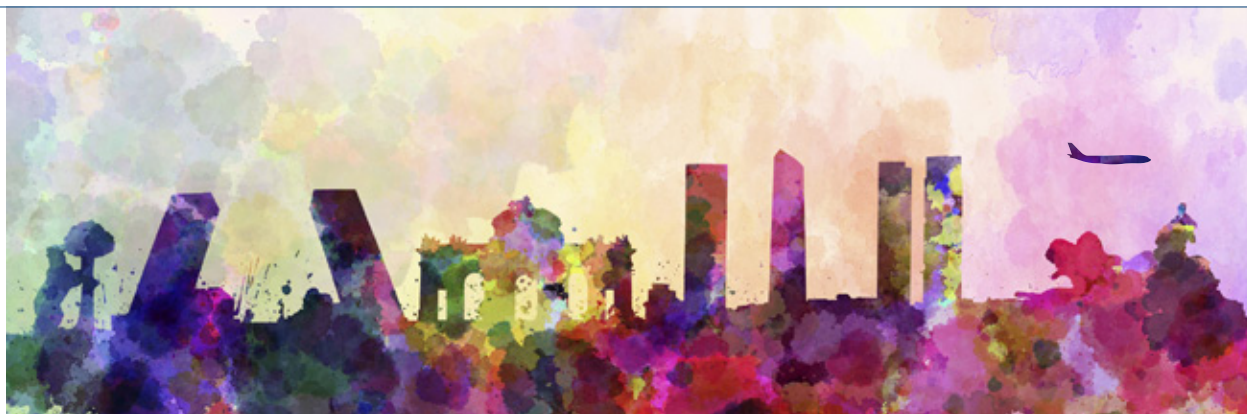
“...the greatest security lesson we can already take from the loss of MH370 is, yet again, our failure to connect the dots, our failure to use common sense and our failure to empower those responsible for effecting security controls with the necessary, and available, information for them to make intelligent decisions...”

For as long as we rely on airlines who cannot check databases and on people who have to compare a photograph with a passenger, people will get through. Apart from anything else, we must accept that it is far more difficult for security officers to evaluate photographs in passports where the holder is of a different

ethnic background; in Asia or Africa it is as much of a challenge for screeners to evaluate a Caucasian's photograph as it is for a European Caucasian to evaluate an ethnic African or Asian photograph. When you hear somebody say, ignorantly, “all Chinese look the same”, the same is true in reverse.

Probably the greatest security lesson we can already take from the loss of MH370 is, yet again, our failure to connect the dots, our failure to use common sense and our failure to empower those responsible for effecting security controls with the necessary, and available, information for them to make intelligent decisions. Even if our two Iranian passengers, travelling on Austrian and Italian passports, were not the cause of the loss of MH370, they should, and could, have been identified.

Let's face it, we had two people who had bought consecutive tickets in Thai Baht at a travel agency in Pattaya, Thailand, for journeys with similar but different circuitous routings to Europe. Both trips started in Kuala Lumpur and required a 10-hour transit in Beijing before onward travel to Amsterdam



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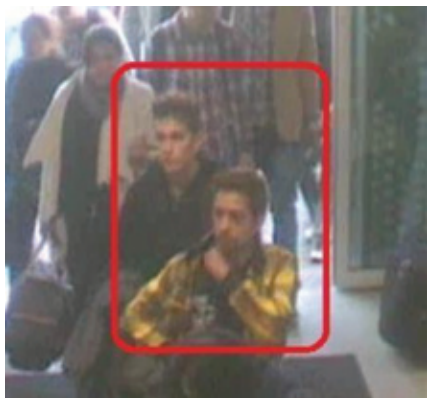
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Two of the passengers who were later found to be carrying stolen passports are seen here on CCTV footage

and then, their paths diverging, ending in either Copenhagen or Frankfurt. That is not the baseline expectation of passengers travelling on MH370. But then, airport screeners wouldn't have known that information – they are not considered worthy of it. The loss of MH370 further demonstrates the silo mentality of the agencies and entities responsible for aviation security – immigration inspect documents, airlines hold (and sometimes share with government) passenger data, screeners look for prohibited items rather than negative intent and customs worry about what is being imported.

If we do not know who is travelling on our aircraft, how can we reasonably be expected to perform effective controls? Many States, including the UK and the US, do not even perform immigration controls on departing passengers. And the problem is further exacerbated on domestic flights in many countries, such as Australia, where passengers are not even required to carry nationally accepted ID. Whatever regime we have in place for international flights should apply to domestic aviation too. After all, the majority of hijackings have taken place on domestic flights, as have the most devastating terrorist attacks in aviation history.

External Considerations

There are two other scenarios we must consider and they relate to attacks from outside the aircraft: missile attack and cyber attack.

Given that we now know that whoever was at the controls also intentionally changed direction, we can probably rule out any missile attack against the aircraft, albeit that the possibility still exists of another State having identified MH370 as a rogue aircraft entering its air space and then shooting it down when it failed to identify itself...

“...even if our two Iranian passengers, travelling on Austrian and Italian passports, were not the cause of the loss of MH370, they should, and could, have been identified...”

It would not be the first time that has happened. The Israeli Air Force shot down Libyan Arab Airlines flight 114 on 21st February 1973, after the aircraft had lost its way in bad weather and had experienced instruments failure; the crew had, allegedly, refused to comply with Israeli requests for the aircraft to land resulting in the Israelis opening fire fearing that the aircraft might be heading towards Tel Aviv. The Soviet Union also shot down Korean Airlines flight 007 on 1st September 1983 when it strayed off course as the result of pilot error. How quickly would a state admit responsibility for such an error today? Were such an incident to occur today, especially in the area of the South China Sea, the political fallout would be monumental...

The possibility of a cyber attack is the nightmare scenario for the industry. We have control over preventing most of the other scenarios through either profiling or the use of technology or a combination of the two. If MH370 was, or any other aircraft is ever, the subject of a cyber attack, the impact on the aviation industry would be catastrophic as confidence amongst the flying public would plummet. Furthermore, there is little the industry itself can do to make itself resilient to such an attack.

Last year, there was considerable speculation on social media that an aircraft could be hijacked by somebody on the ground using a computer or mobile phone. The aircraft manufacturers responded by saying that even if one could do so in principle, the pilots would always be able to override any such external interference. I hope they are right... ■

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