

The Third Layer

The Missing Component in Air Cargo Security

This article represents a summarized extract from a comprehensive ongoing study of emerging threats against commercial aviation through air cargo. The fuller story depicts a foreshadowing crisis for global supply chains; potentially endangering the economies of import dependent countries, the most significant of these being the United States, which leads the global import table with nearly 17% of all the world's imported goods.

The author is an aviation, logistics and government security analyst whose cargo security work has taken him to many parts of the world. In the years since 9/11 he has monitored the work of regulators with mounting concern arising from the slow pace and timidity of the effort to manage air cargo security. It is his contention that sometime between 2007 and 2010, the world will witness a return of the 1970s and 1980s cycle of bombing attacks on commercial aircraft. He believes that one or more contemporary attack modes; the advancement and sophistication of improvised explosive devices; and more ambitious targeting strategies, will prove more deadly than ever before. He argues that regulators are depending too heavily upon two costly and potentially ineffective security principles that will in the end fail to prevent the most determined enemy from launching a successful attack. The third layer of protection offers the prospect of not only filling the void left by the first two; it provides the opportunity to counter and mitigate an air cargo bomb attack regardless of whether those other layers are in place. In this summarized scenario, David Forbes focuses on the region of the world from whence he says a primary threat will emanate.

Just as travelers were beginning to relax...

Terror attacks on civil air operations come in cycles. But we have yet to determine a climatic type pattern, as aviation is still relatively new, and its target appeal fluctuates with perceived protection levels that rise most sharply in the immediate aftermath of a serious attack. From 1949 through 1989, ninety-four bombings and attempted bombings against airliners were recorded. Whereas the motives in the early years for attacking aviation and trying to kill passengers and crew were mixed – the first such bombing recorded in the US in 1955 was intended to reap the benefits of an insurance death policy - the opportunity for political terrorists to use the threat as a bargaining tool became painfully obvious through increased hijackings and bombings in the sixties, and steadily grew in the seventies.

During the 1970s and 1980s, the world's commercial airlines were targeted numerous times by those who chose to place improvised explosive devices in various places on board aircraft. Forty-four bombings and attempted bombings took place in the seventies, a peak decade comprising almost 47% of attempted bombings over four decades, fifties through eighties. On twenty-six separate occasions during the 1980s, bombs were placed in various parts of airliners. Not all of these were detonated. But the most devastating incidents occurred in this decade. In 1985 [Air India, 329 killed], 1988 [Pan Am, 259 on board killed, 11 on the ground killed], 1989 [UTA, 171 killed, and Avianca, 107 killed].

It is notable that these four events spanning just over four years in which 877 people died, occurred during a period when governments throughout the world were becoming more vocal about their determination to fight the scourge of hijackings bombings and 'unlawful interference' of aircraft. The

US aviation security initiatives that followed the 1987 fatal crash of PSA flight 1771, when a former employee of USAir defeated access controls and used a firearm on board, was one factor that generated renewed interest in aviation security. But the bureaucratic machinery grinds slowly and all this proved insufficient to deter the terrorists as the eighties came to a violent end. The intensity of what followed may have finally persuaded them to try other tactics, as the risk of prevention and detection rose with new security disciplines introduced to satisfy a frightened public.

In 2000, Security Magazine published a detailed article that explained how \$60 million had been spent to protect the World Trade Center in New York, after a truck bomb attack by Islamic extremists in 1993. Six people were killed, and more than one thousand injured. The magazine headline, seven years later, crowed; "**Never Again**: The World Trade Center fights against the threat of terrorism with one of the most sophisticated security systems in the world".

Few who have studied the terrible events of 9/11 will have forgotten what one of the perpetrators, Ramsey Yousef, is alleged to have told an FBI agent when in 1995 he was flown to New York to face indictments. The FBI agent reportedly mentioned that the towers were still standing. It is reported that Yousef replied, "They wouldn't be if I had enough money and explosives." Six years from the time he made that statement the towers were gone. 'Never Again', proved to be very poor judgment. In reality it translates to 'Unimaginable'. Imagined by the assailant, but not by the victim. And so it is. It remains the terrorist agenda, not ours, to determine how and when they will strike commercial aviation again. The attack itself is unlikely to be a piecemeal operation. The scale of the attack and the prize must for them suck out, then breath in, the oxygen of publicity so that the world remains breathless, for months, perhaps years.

The planning may be slow, deliberate, and painstaking, but the enemy knows its prey. We don't have the patience, the tenacity, or the imagination to match. We want to believe the hyperbole of leaders who truthfully often do not know what they are talking about when it comes to urban trench warfare against ideologues and suicidal fanatics; and even less when it comes to recognizing how consummately easy it is to penetrate air cargo shipping operations, place a deadly device and then, using today's best and readily available technology, create mayhem with the supply chains of the developed world.

The rush to recover could become the run for cover...

The US domestic economy absorbs imports like a giant 24/7 vacuum cleaner. Increasing volumes of imports originate from Asia, especially China. But countries of South East Asia export appreciable amounts of their products and raw materials to the US; and several of these countries, unwillingly or unwittingly so far as we are aware, accommodate Jihadist terror groups that harbor malice and nurture violent intentions against the United States its allies and sympathizers. What would happen, how will we react, if these supply chains are attacked? How different might this be from the response to 9/11? What if the supply chain is used as a weapons delivery system that detonates at destination as well as in transit?

The United States is the second largest destination for Indonesia's exports. Its top export destination is Japan, which takes more that 22% of all Indonesian exports; and the US is second with just over 12%.

The United States is the top destination for Malaysia's exports, at nearly 19%.

The Philippines top export destination is Japan, which takes just over 20%; and the US is a close second, taking a little more than 18% of all The Philippines' exports.

The United States is the top export destination for Thailand, with close to 16% of all that country's outbound shipments.

These four countries together make up 13% of the trans-pacific air cargo market. The Jihadist threat is ever present in each, and their ability to coordinate, collaborate and carry out attacks is a disturbing prospect. These groups connect in several dimensions, including training and resource procurement, with others as far away as Afghanistan, Pakistan, Bangladesh and Sri Lanka. In Indonesia, the most notorious and frequently active Jihadist group is Jemaah Islamiah [JI]. This group is increasingly referenced in reports of alliances and also attacks in other countries. One affiliation is the Kumpulan Mujahidin Malaysia [KMM]. In the Philippines, Jemaah Islamiah and two other Jihadist groups, Abu Sayyaf and the Rajah Solaiman Movement (RSM), a radical wing of Filipino Balik Islam, have recently come together in some of their terrorist operations. In January 2006 it was reported in the Australian press that Jemaah Islamiah-linked terrorists in southern Thailand are believed to be planning to transform their insurgency from attacks against the Thai state to bombings of Western tourists.

**Air Cargo –
Timid Defenses,
The Disease of Denial,
Wanted Urgently - Industry Imagination**

Having worked in the region described, and having walked the docks of the air cargo warehouses, watched the systems and talked with industry workers, I have no hesitation in saying that the two principal layers of air cargo 'protection' promoted by the US government will not save us.

Attributing too much reliance upon the Known Shipper program is a vain and expensive self-deception. The program has a limited defensive-layer value. It also has great potential for helping our enemies because it is akin to the terrorists' Trojan Horse. In the overall value of its contribution it probably represents less than 10% effectiveness as a deterrent or prevention mechanism. It has a questionable return on investment, engaging as it does the combined expanse and expense of a complex geographical web of door-to-door manufacturing, assembly, packaging, transit and handling operations.

Some observers recognize that this program goes well beyond imperfection. It is a palliative, a compromise that effectively says we are making an effort. It is easy to picture the day when regulatory officials who have historically backed off from pressing for real solutions, shrug their shoulders when a series of air cargo bombings strikes the system.

Screening of air cargo to deter and detect the introduction of IEDs into the air cargo networks is a logistical nightmare. The production of equipment from current research and development focused on technological pre-board screening of cargo is not only a dim prospect for the near to middle term, it faces insurmountable obstacles beginning with capital cost, maintenance expense and policing of standards to counter the 'snake oil' effect.

Safety issues for operators and the environment, arising from applications that harness principles of nuclear physics; from the intricacies of the unpredictable characteristics of multifarious air cargo shipments; to the dangers imposed by demands for ever faster freight processing; all descend upon our hopes for technological solutions, like a ton of cement on a fresh chicken's egg. Try to imagine the day, when an affordable machine, easily accommodated, safe to its operators and others in the vicinity, capable of very rapidly analyzing a shipment or combination of shipments of any size, shape, weight and density and detecting the presence of an IED with close to zero false positive readings, is deployed at every cargo handling airport in the world. Not this side of 2050, and unlikely after that.

Why do I say that to be effective this would be deployed at airports and not in a prior link in the supply chain? Because nothing less than an immediate ramp side pre-boarding screening will be acceptable. There are too many opportunities and methods available to interfere with shipments during off-and-on-airport ground based processes for any other protocol to be tolerable.

We are then, decades away from relying upon technological screening of air cargo. But machines, even those that are less than perfect in their performance, are likely to be deployed for routes identified as vulnerable while providing critical supplies. When compared with the known shipper approach, the effectiveness is also going to be limited, with an overall deterrent, prevention and detection value of less than ten per cent.

The Explosive Cocktail Air Cargo Threat

Risk Matrix Ingredients:

- Attackers rehearsing new methodologies, video taping and focusing on successful techniques [Iraq, Afghanistan, Pakistan, etc.] e.g. IED attack rate in Iraq has reached 40 [forty] per day
- Suicidal fanaticism replenished by youthful Jihadist population
- Hawala banking used by terrorists – no money audit trail
- Bribery and Corruption – a lucrative feature of life
- Low wages – open to deals and terrorist infiltration/penetration
- Ocean piracy – funding source + creating peaks in air cargo
- Drug trafficking – established links between Jihadist countries
- Arms trading – growing black-market; trade links between cells
- Cost cutting – pressures on the aviation system
- Time sensitivity – pressures on security disciplines
- Open skies agreements
- Predictable aviation security mandates
- Poor quality management of US dominated aviation security
- Terrorist access to, experiments with, aviation security technology
- Jihadist ideologues seeking a single Islamic state in South East Asia
- And much, much more....

Both the known shipper and technological cargo screening approaches to air cargo security have inherent weaknesses, and will be defeated through the effect of critical mass. We already know

that less than eight per cent of ocean containers arriving in the United States ports are 'screened'; and we only have the officials' PR word for it that these are treated in a manner that recognize and meet the latest tactics used by smugglers and terrorist interests.

Similarly, we have good reason to believe that the Federal Air Marshals Service can only offer protection for around two per cent of US originating passenger flights. Both systems of defense have hit the proverbial growth-stall, for a number of reasons that I will not detail here. But it is necessary to acknowledge that there are conceptual and deployment flaws that make other, significantly better, security layers, vital, to augment those described and to try to fill the massive effectiveness void that remains.

In air cargo, penetration of the operating systems in the final minutes before aircraft loading can defeat entirely the known shipper and technology screening defenses. A large, heavy, expensive and technically complex machine sitting at every aircraft dock or gate and operating at speed is an unrealistic expectation. The screening protocols for passengers have no comparable equivalent. The security of the passenger cabin, with reinforced cockpit doors and potentially armed flight deck officers; and the post-check-in screening including explosive 'sniffers' or trace detection systems, is routinely devalued by the presence of unscreened cargo stowed in the hold beneath the feet of the passengers. In dedicated freighter aircraft, the risk emphasis is different, but nonetheless significant, presenting opportunities to dispatch more lethal combinations of cargo for detonation and fall-out over or immediately upon, a specific US city target site.

Policy – Common Denominator Concentration – the Aircraft

As all of the threats and vulnerabilities converge, we must focus on the risk target – the aircraft. How well designed and equipped is the plane in the context of survivability if an IED is detonated inside the cargo hold?

Deep inside the reports of congressional sub-committees, the General Accountability Office, Inspectors General and other relevant sources, we can find mention of 'aircraft-hardening' as a protective measure of interest. Yet we rarely see anything of substance on this topic, and even less often is there a sign of some determined political follow up investigation, for example engaging airframe manufacturers and cargo container makers.

Although one company has had a unit load device [ULD] certified by the FAA for use on civil aircraft, based upon its blast resistance properties, discussion on developing the approach is limited. The capital expense of each container and the additional lift weight, have resulted in airlines and their representative association opposing mandatory deployment and declining voluntary purchase.

If tomorrow five aircraft – passenger and freighters among them – were blown out of the sky by cargo bombs while on final approach to five different major US airports, you can bet that aircraft blast resistance would become the order of the day, once that is, the government reluctantly admits this is what occurred. Progress will then come as a race against time, through accelerated development programs, the pumping in of billions of dollars to try to avoid severe harm to the air-dependent US economy, and the threat that without tens of billions of dollars in taxpayer bailout money, insurers will finally withdraw from the aviation market.

The Third Layer – Aircraft blast mitigation containers and liners

The limited percentage protection value of existing programs, even when these have been more widely developed over many years, leaves us with a cargo security void overall of at least 80 per cent. Put another way, the pace of progress by the Jihadists will within four years enable our enemies to simultaneously bring down several commercial aircraft through careful selection of cargo operations, airlines and routes that offer them a success rate of four out of five attempts. Further, intelligent use of acquired western technology will facilitate greater accuracy for targeting and detonation close to or at chosen destinations. The devastation factor, the scale of loss of life and property, will not necessarily be the only motivating force behind the attacks. The confidence of the American public in its air travel and commerce system will alone be a very attractive target, potentially heaping unimaginable havoc on the US economy.

It is time, and long overdue, for the effort toward affordable aircraft hardening to be brought to the top of the agenda. In the coming few years we need to see a major cargo container replacement program, with an influx of the latest mitigation containers that will in time result in more than 25% of all containers in the system offering blast resistant capabilities. We don't need every container to be blast resistant, but sufficient as a percentage and in a patterned distribution to radically improve the ratio of protection and to reduce the attraction of IEDs being used against civil aircraft. Although I do advocate the use of known shipper and technological screening *as early stage components in the defensive security layer*, blast mitigation is potentially the only layer that can succeed in protecting the aircraft even without the benefit of either or both of the other layers.

Air cargo containers that perform to the necessary standard and that are affordable are being developed at the time of this writing. Congress, regulators and the industry need to get this on board pronto. Then the airframe manufacturers should come close behind. As they modernize equipment offerings with composite materials, better fuel performance, extended range capabilities, and much more, they need to remember that modernization and their order books will come to nothing unless they too focus on security design to keep future passengers and crew safe and alive.

David Forbes
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