



AVIATION SECURITY IN MALAYSIA

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Southeast Asia Regional Centre for
Counter - Terrorism
(SEARCCT)
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Dedication

**This work is dedicated to the late
Khairil Hisham Ahmad (1977 – 2008)
Ministry of Foreign Affairs,
Malaysia.**

My colleague and friend.

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FOREWORD

This study undertaken by the Southeast Asia Regional Centre for Counter-Terrorism (SEARCCT), through Mr. Thomas Koruth Samuel is an attempt to assess and identify areas within Malaysia's aviation industry that could be vulnerable and would be likely targets to be exploited by terrorists.

In this context, the author looks at the possible exploitation of loopholes in managing flying activities, utilization of microlights and aircrafts and the handling of airstrips, flight parks and airports by unmonitored and unregulated flying enthusiasts.

He subsequently suggests a possible security framework involving flying enthusiasts, flying operators, flying schools and clubs and the regulating governing body overseeing flying within the country. These coordinated efforts, to bring a semblance of order with the appropriate regulatory mechanism, would at the end of the day offer the best protection in both the short and long term.

The statement that "while we have to be lucky all the time, a terrorist has to be lucky just once," often times quoted by those from the enforcement agencies, is a stark reminder of the weight that must be shouldered by the relevant enforcement agencies to ensure that nothing outwards touches the lives of Malaysians.

Hence, though we realize that while ultimately God holds the future, it is imperative to understand that our efforts now will, to a great extent, determine that future.

AMBASSADOR DATO' HUSSIN NAYAN
DIRECTOR GENERAL
SOUTHEAST ASIA REGIONAL CENTRE FOR COUNTER-TERRORISM
MINISTRY OF FOREIGN AFFAIRS
MALAYSIA

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Finally, to God Almighty, who through His grace, mercy and love, has made all this possible.

INTRODUCTION

The 11 September 2001 tragedy in New York, the 7 July 2005 bombings in London, the 27 February 2004 Superferry bombings in the Philippines and the 11 March 2004 Madrid bombings all had one chilling factor in common; the deliberate and systematic attack on civilians via the transportation system. Neither sophisticated weaponry nor military tactics were employed, but the final result left more than 3,000 dead and many more wounded in New York, more than 50 people dead and 700 wounded in London, more than 110 dead in the Philippines and more than 190 dead and 1700 wounded in Madrid.

The terrorists have learned that the transportation system accords them tremendous potential, not only to kill but to disrupt the lives of the ordinary citizen and generate tremendous fear in the process. Hence, targeting or using the transportation system of a country to deliver the message of the terrorist is now a very 'attractive' option. The aviation industry, is particularly vulnerable, as the media impact of terrorists utilizing an aircraft, big or small would be phenomenal.

What do we do?

Thus far, we have reacted but perhaps not responded well. While numerous stop-gap efforts have been undertaken, a comprehensive overview of the vulnerabilities of the transportation system has yet to take place in most countries, particularly in the field of aviation. Added to that, while terrorists have began to 'creatively' look at developing their tactics, means and methods; security and enforcement forces are often lagging behind, one step too slow in detecting, deterring and disrupting acts of terror. Until we have identified such areas and taken the necessary measures, we are sitting on a

ticking time bomb.

While this study is by no means exhaustive, it is intended to spark further research into the field of aviation security, with the hope of safeguarding both our collective and national interests.

The ball is now at our feet and should we not make the first move, rest assured, they will.

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MICROLIGHTS AND TERRORISM

Introduction

There are certain areas within the aviation industry which are vulnerable and can be exploited by terrorists. This was tragically demonstrated on 11 September 2001. While efforts have been undertaken to ensure that we have learned from that particular incident, there is a need to think out of the box, particularly when dealing with aviation terrorism.

Learning from Experience

It is significant to note that in total, 30 passengers on flights around the world had already broken through cockpit doors during the 24 months leading to 9/11. In early June 2001, when the leaders of the 'Group of 8' nations met for their annual meeting in Genoa, Italy, the Government of Egypt sent a warning to the Bush administration about a possible suicide hijacker. This was further reinforced during an interview with the French newspaper *Le Figaro*, when Egypt's President Hosni Mubarak said that his government had uncovered a video where Osama bin Laden "spoke of assassinating President George Bush and other Heads of State in Genoa...using an airplane stuffed with explosives". To respond to this potential threat, anti-aircraft missile batteries were placed around the city during the summit.¹

Besides the warning from Egypt, several other governments also notified the United States (US) of increased Al Qaeda activities and the rising specter of an attack on the United States. Russian intelligence had notified the Central Intelligence Agency (CIA) in 2001 of 25 terrorist pilots who had been specifically geared towards suicide missions. In an interview, President Vladimir Putin confirmed that in August 2001, he had ordered the Russian intelligence to warn the US Government 'in the strongest terms' of imminent attacks on airports and government buildings.²

¹ David Sanger, "Two Leaders Tell of Plot to Kill Bush in Genoa," New York Times, 26 September 2001

² Norta Trulock, "Poorly Served," Accuracy in Media [online]
www.aim.org/publications/weekly_column/2002/05/23.html , 23 May 2002

In June 2001, the *Bundesnachrichtendienst* German Intelligence Service (BND) warned the CIA and Israel that Middle Eastern terrorists were “planning to hijack commercial aircrafts to use as weapons to attack important symbols of American and Israeli culture”.³ On most occasions, these warnings were thought to be unwarranted and the intelligence agencies overtly paranoid. In fact, numerous studies showed that serious flaws within the system were either ignored or side-stepped and were only reviewed after the 9/11 tragedy.

Regrettably, the aviation industry is an attractive target for terrorism for the following reasons:

- The ability to capture media attention and to advertise the terrorists’ cause and demands to the international arena;
- The ability to achieve tactical gains such as ransoms or the release of terrorist colleagues in prison;⁴
- The ability to prove the vulnerability of advanced countries to this form of attack; and
- The ability to magnify the consequences of their actions and thereby cause a distorted amount of changes in the international arena.

It is also significant to note that there has also been a trend towards greater lethality in terrorist attacks.⁵ Terrorists have both developed and heightened their capability to commit mass murder by utilising aircrafts.

Utilising an Aircraft as a Flying Missile

As mentioned before, the idea of using an aircraft as a flying missile is not a new one. Prior to the 1996 Olympics in Atlanta, US intelligence officials at the Federal Bureau of Investigation (FBI) and CIA had identified crop dusters and suicide flights as potential

³ Norta Trulock, ‘*Poorly Served*’, *Accuracy in Media* [online] www.aim.org/publications/weekly_column/2002/05/23.html, 23 May 2002

⁴ ‘*Evolution of Aviation Terrorism : Hijack*’, Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007

⁵ ‘*Evolution of Aviation Terrorism : Sabotage Bombing*’, Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007

terrorist threats and took steps to prevent any attacks from the air during the Games by deploying Black Hawk helicopters and Customs Service jets to intercept suspicious aircrafts in the skies over Atlanta.⁶

In 1995, the FBI was warned of a terrorist plot to hijack several commercial airliners and crash them into the Pentagon and the CIA headquarters. In January of that year, a fire in the Manila apartment building of Abdul Murad and Ramzi Yousef led Philippine investigators to uncover a plot to plant timed explosive devices on several US airliners. Abdul Murad confessed to the detailed plans to simultaneously blow up several planes over the Pacific Ocean while he and another suicide hijacker would each carry out a kamikaze suicide attack on the CIA and the Pentagon respectively.⁷ Ramzi Yousef, the ringleader of the first World Trade Centre bombing in 1993, when arrested, confessed in 1995 that he had narrowly missed several opportunities to blow up a dozen airliners over the Pacific in one single day and carry out a suicide attack on the CIA headquarters.⁸

In December 1994, an Air France flight in Algiers, Algeria, was hijacked by the *Groupe Armee Islamique* or Armed Islamic Group (GIA) to punish France for its assistance to the Algerian Government and to draw attention to the Algerian conflict.⁹ The hijackers ordered the plane to be flown to Marseilles, France. There, the authorities were ordered to load an additional 27 tons of aviation fuel for a journey to Paris, although the trip required only about one-third that amount. The hijackers' aim was to crash the plane into the Eiffel Tower. However, while still on the ground, commandos from the French Special Force stormed the plane and ended the crisis.¹⁰

⁶ Mark Firemen and Judy Pasternak, "Suicide Flights and Crop Dusters Considered Threats at 96 Olympics," Los Angeles Times, 17 November 2001

⁷ Doug Struck et al., "Borderless Network of Terror, Bin Laden Followers Reach Across the Globe," Washington Post, 23 September 2001

⁸ John K. Cooley, *Unholy Wars*, Sterling, Va.: Pluto Press, 1997, p. 247

⁹ Rohan Gunaratna, *Terror from the Sky*, Jane's Security News, 21 September 2001, http://www.janes.com/security/international_security/news/jir/jir010924_1_n.shtml

¹⁰ Andrew R. Thomas, *Aviation Insecurity: The New Challenges of Air Travel*, Prometheus Books, 2003, p. 21

In the 1980s, Palestinian terrorist groups based in Lebanon planned, prepared and launched air vehicles to gain access into Israel. However, due largely to the alertness of the Israelis and the unreliability of light air vehicles, their cross-border operations ended in failure. Nevertheless, terrorist groups with access to state sponsored resources continued in their attempts to utilise aircrafts. The Palestinian Liberation Fund (PLF) procured approximately 100 light aircrafts and gliders from Europe with Libyan financing. The aircrafts were adapted to be able to carry two men and 180 kg of explosives. The crafts were expected to fly the explosive-laden cargo into Israel.¹¹ The PLF also tried to attack Israeli oil refineries with two powered hang-glidors in March 1981. In November 1987, the Popular Front for the Liberation of Palestine – General Command (PFLP-GC) launched four hang-glidors, in Syrian-controlled Lebanon, against the Israeli army; one pilot landed and inflicted 16 casualties before being shot.¹²

The most deadly case of utilising an aircraft as a missile, however, occurred on 11 September 2001, when four planes were hijacked by 19 terrorists. Two of the flights were crashed into the north and south tower of the World Trade Centre. The third flight was crashed into the western side of the Pentagon while the fourth flight, following passenger actions against the hijackers, crashed into the Stony Creek Township, Pennsylvania. The hijackings led to the deaths of approximately 3,000 people, including all the passengers and crew on the four flights.¹³ The 9/11 attacks reportedly cost the Al Qaeda an estimated USD 500,000 while the resultant monetary loss calculated seen by the infrastructure, properties and businesses affected, was said to be in the range of trillions of US dollars.¹⁴ This amount excluded billions of dollars spent by the US and the coalition allies on the ensuing War on Terrorism in Iraq and its consequent occupation.¹⁵

¹¹ Rohan Gunaratna, *Terror from the Sky*, Jane's Security News , 21 September 2001 , http://www.janes.com/security/international_security/news/jir/jir010924_1_n.shtml

¹² Cristopher C. Harmon, *Terrorism Today*, Cass Series on Political Violence, 2000.

¹³ Cletus C. Coughlin, Jeffrey P. Cohen and Sarosh R. Khan , *Aviation Security and Terrorism : A Review of the Economic Issues* , The Federal Reserve Bank of St. Louis , 2002 , <http://research.stlouisfed.org/wp/more/2002-009>

¹⁴ '*The Need for Effective Aviation Security System*' , Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007

¹⁵ '*Al Qaeda in Aviation Terrorism*' , Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007.

It is also pertinent to realise that numerous other instances of terrorist incidents involving the crashing of airplanes into targets have already occurred. Between 1972 and 2001, the plan of flying airplanes into buildings had been cited on at least 22 occasions¹⁶. Potential uses of powered small aircrafts for bomb runs, commando raids, suicide bombings, radio-controlled non-human bombs and disbursement of chemical or biological agents is conceivable.

Hence, terrorists utilising aircrafts as potential missiles is both possible and plausible as the strategic advantages of utilising aircrafts, particularly in suicide missions, are significant; among them being:

- It is a relatively simple and low-cost operation which avoids the need for escape routes or complicated rescue operations;
- It generates massive casualties and extensive damage since the suicide bomber can choose the exact time, location and circumstance of the attack to ensure maximum damage;
- There is no fear that interrogated terrorists will surrender important information simply because their deaths are certain;
- It has an immense impact on the public and the media¹⁷; and
- It highlights the cause of the terrorists in a very dramatic fashion.

The Ability to Fly the Plane

It is significant to note that the skills involved in flying a plane is not that difficult to learn or obtain. Experts have concluded that classroom training, individual computer-based training and sessions in simulators are sufficient to enable a novice pilot to familiarise himself with the layout of a flight deck and the operations of flight controls, autopilot and navigation systems. Flying the aircraft in other phases of flight, besides taking-off and landings, are relatively easy. Also, when he is trained to fly in a specific aircraft, flying another kind of aircraft is very much possible. Changing the aircraft's course, speed or altitude is not very difficult when using the autopilot system or when

¹⁶ Adam Dolnik, *Understanding Terrorist Innovation : Technology, Tactics and Global Trends* , Contemporary Terrorism Series, Routledge, 2007.

¹⁷ Andrew R. Thomas , *Aviation Insecurity : The New Challenge of Air Travel*, Prometheus Books, 2003 , pg. 144

flying the aircraft manually. The flight control system makes the aircraft responsive, making it easy for the novice pilot to perform normal flying maneuvers.¹⁸

Given the fact that the most difficult components for an amateur pilot to master are the taking-off and landing the airplane, it is significant to note that there are numerous software programmes in the market that allow flight simulation of different types of aircrafts to land and take-off in various airports of the world. According to the principal of a flying school in Malaysia, these applications are either free or sold at a very low price (e.g. Microsoft Flight Simulator 2004). The simulations can provide the amateur pilot a comprehensive feel of the aircraft at any specific airport. The internet has also been a valuable training ground for those wanting to learn flying. The Aircraft Owners and Pilots Association (AOPA) have a flight training website (flighthtraining.aopa.org) which has been set up for those who are learning or intending to learn flying.¹⁹ With these developments, the major problem the terrorist has of adjusting himself to the hijacked aircraft is greatly diminished.

Flying in Malaysia

All matters pertaining to the licensing of pilots and aircrafts in Malaysia are handled by the Department of Civil Aviation (DCA), which is under the purview of the Ministry of Transport. To be able to fly in Malaysia, one has to have a Private Pilot License (PPL). In order to do so, a person has to register himself with a flying club or school. The PPL is normally the first step before he attempts to take the Commercial Pilot License (CPL); this allows him to work as a pilot and subsequently to undertake an Airline Transport Licence (ATPL), which allows him to fly a large aircraft.

After enrolling in the flying school or club, the person has to apply to the DCA for the Student Pilot License (SPL). This license allows him to fly instructional (dual) sortie with an instructor. The pre-requisite for holding an SPL is only a pass in a medical

¹⁸ Andrew R. Thomas , *Aviation Insecurity : The New Challenges of Air Travel* , Prometheus Books, 2003, p. 21

¹⁹ AOPA Launches Flight Training Web Site , 1 January 2005 , www.studentpilot.com/articles/news_releases/articles.php?news_id=95

examination (Class 2 medical exam).

A person can obtain a PPL from the age of 17. There are no minimum academic requirements to acquire a PPL license but there is a need to pass a Class 2 medical examination (as with obtaining an SPL). This medical examination can only be carried out by specialist aviation doctors. During the Class 2 medical examination, the general health, hearing and eyesight of an applicant will be tested. If the applicant is below 40, he must renew his medical license every two years. If the applicant is between 40 and 60, he must renew his medical license every year and if the applicant is 60 or older, he must renew his medical license every six months. If the applicant is unable to pass the medical examination, he can continue to fly with an instructor, but cannot hold a PPL.

Another requisite before obtaining a PPL is an aviation document requiring the applicant to be assessed as 'Fit and Proper' to hold this license. To be considered 'Fit and Proper', he must have demonstrated an acceptable respect for the law, such that the DCA may have confidence in his ability to fly within the Civil Aviation Rules. This document would also ascertain if the applicant has had prior criminal convictions. The applicant is required to remain a 'Fit and Proper' person throughout the operating life of his license.

The actual PPL course comprises several parts; both written and practical. The practical aspect covers the actual training to fly the plane. Most students would fly solo for the first time after an estimated ten to 15 hours of flying lessons. A full PPL requires a minimum of 45 hours of flying, however, the majority of the students would have completed about 70 hours of flying before they are ready for the flight test.

Alternatively, a person could train for a PPL that confines flying to near the aerodrome at which he is trained. This license requires a minimum of only 40 hours of flying as it will not include cross-country training.

The theoretical component of the PPL comprises six examinations which are set at about the same level as the *Sijil Pelajaran Malaysia* (SPM) Malaysian examination or the UK based O' level examination. A pass mark of 70 percent or greater is required to obtain the license. One does not have to pass these examinations before beginning flying lessons, but it is advisable to take them progressively while learning to fly as examination passes are a requirement before one can attempt solo cross-country flying.

The six core components covered in the PPL are:

- **Air Navigation and Flight Planning**, where one will learn to calculate the distance of one's planned flight, the compass heading one will need to fly, the time taken to fly and the amount of fuel needed for the proposed flight. One will also learn to use maps that are specifically designed for aviation;
- **Aircraft Technical Knowledge**, where one will understand how an aircraft flies and the systems involved. As a trainee pilot, one will also learn about the aerodynamics, engines, electrical systems, flight instruments and the loading of an aircraft;
- **Meteorology**, where one will learn about Malaysia's weather patterns, cloud formations and the effects of weather conditions on the performance of an aircraft;
- **Human Factors**, where one will learn the human elements in aviation. Areas of study would include aviation medicine and health, stress management, and decision-making skills;
- **Flight Radiotelephony**, where one will learn how to communicate using the telecommunication equipment on board. One will also learn how to operate one's aircraft's transponder and emergency locator beacon; and
- **Law**, where one will learn the various laws governing and regulating the aviation industry. These standards are set out in the Civil Aviation Regulations 1996.

Upon completion of the candidate's medical examination, passing the six papers, fulfilling the required flying experience, and passing the flight test, the candidate can then apply to the DCA for a PPL. The cost of obtaining a PPL in Malaysia is approximately RM 25,000 to RM 30,000.²⁰

Microlights

Definition

The definition for microlights varies. In the US, the term ultralight is used. The ultralight, is defined in Federal Aviation Regulations (FAR) Part 103, as a single seat powered flying machine which weighs less than 254 lbs, has a top speed of 55 knots (63 mph), stalls at 24 knots (28 mph) or less and carries no more than five gallons of fuel. In the US, there are strict operating limitations but no mandatory license or registration.

Among the restrictions include:

- No passengers allowed;
- No flying over towns and settlements;
- No flying at night or above (or in) the clouds;
- No flying in airspace around airports with control towers and certain other airspace without prior permission;
- No commercial operations (for hire) except instruction; and
- The need for ultralights to yield right-of-way to all other aircrafts.²¹

In Malaysia, the DCA differentiates between a microlight and a kitplane. The microlight in Malaysia is defined by the following criteria:

- Empty weight of not exceeding 150 kg;
- Wing loading at maximum empty weight not exceeding ten kg per square metre;
- and
- Seating capacity not exceeding two persons, including the pilot.

²⁰ "How to Be a Pilot", Department of Civil Aviation (DCA), Malaysia, January 2006

²¹ "FAQ About Ultralight Aircraft, www.ultralighthomepage.com/ultraFAQ.html, 23 August 2007

The kitplane is defined by the following criteria:

- Maximum Take-off Weight Authorized (MTWA) not exceeding 750 kg;
- Seating capacity not exceeding two persons, including the pilot;
- Equipped with a single piston engine; and
- Can be constructed from kit parts, blue prints or build plans.

Microlights and kitplanes need to be approved by the DCA before they are considered airworthy. The exact criteria for the acceptance of a microlight and a kitplane as well as the licensing requirements for the issuance of the PPL are specified by the DCA. If the aircraft is built from a kit, the DCA needs to approve the builder of the craft. The exact criteria for the approval of a builder are also specified by the DCA. With regard to the renewal of the Permit to Fly, operators of both the microlight and the kitplane need the initial approval of the DCA. The exact criteria for the renewal of the Permit to Fly are also specified by the DCA.²²

In Malaysia, some flight operators prefer to categorise their aircrafts into three groups:

- Microlights;
- Experimental aircrafts; and
- Light Sport Aircraft (LSA).

The general technical specifications of microlights flown in Malaysia are:

- One to two-seaters;
- Speeds between 40-50 miles per hour;
- Costs below RM 80,000;
- Range of 40 to 50 kilometres;
- Ability to fly or hover at very low altitudes; and
- Purchase can be made from the US and Australia via the internet and can be delivered within a week.

²² Aeronautical Information Service, DCA, Malaysia

The general technical specifications of Experimental Aircrafts/Amateur Build Aircrafts flown in Malaysia are:

- Two to four-seaters;
- Speeds between 110-200 miles per hour;
- Costs below RM 320,000;
- Range of 100 to 300 kilometres;
- Assembly can be done even without experience or qualifications;
- Maintenance is fairly simple and the fuel used is ordinary fuel and not necessarily aviation fuel; and
- Purchase can be made from the US and Australia via the internet and can be delivered within a week.

The general technical specifications of Light Sport Aircraft (LSA) flown in Malaysia are:

- Two-seater;
- Speed of approximately 180 kilometres per hour;
- Costs below RM 560,000;
- Range of 500 to 700 kilometres;
- Purchase can be made from the US and Australia via the internet and can be delivered within a week;
- Assembly can even be done without experience or qualifications; and
- Maintenance is fairly simple and the fuel used is ordinary fuel and not necessarily aviation fuel.

It is pertinent to note that most microlights are not equipped with transponders, which can be detected by radars to identify flight patterns of planes and to provide flight data such as speed, heading and height. Hence, without the transponder, it will be difficult to detect a microlight by radar, and if it is indeed detected, it will just appear as a blink on the radar screen.

Other factors that would make microlights a credible pick for the terrorist²³ are its ability for night flights (utilising night vision goggles) and its need for short runways (any road or field with an approximate length of 300 feet). There are also at present websites which provide complete guidelines on utilising microlights for violent purposes.²⁴

Given the capability of microlights, there is an urgent need to examine and study the danger of such crafts colliding with commercial aircrafts, either due to acts of terror or acts of dare devilry. It is very possible and indeed plausible that such accidents or acts of terror can be carried out when commercial planes are ascending or descending.

With the size and capacity of microlights, there is an assumption that the danger that they can pose is minimal and as a result, the consequences of any terrorist action involving microlights will also be negligible. However, a careful analysis will show that a crash involving an aircraft, even as small as a microlight, can cause extensive damage and will also cause a ripple effect in numerous other areas. It is also pertinent to note that microlights can also be outfitted with extra fuel tanks and Global Positioning System (GPS) devices that will enable them to fly great distances and with great accuracy.

While the direct damage that can be caused by a microlight is not extensive (such as loss of lives or physical destructions), there are other costs involved; among them being:

- Negative publicity to the aviation industry of the affected country;
- Negative publicity on security agencies and its enforcement capabilities;
- Possible travel advisory ban issued on the country in question and the subsequent economic implications;
- Economic loss as seen in the lowering of the stock exchange; and
- Negative publicity on the country as a whole.

²³ Duncan Lennox , Executive Overview : Jane's Strategic Weapon System , 8 November 2005 , http://www.janes.com/security/international_security/news/jsws/jsws051108_1_n.shtml

²⁴ <http://globalguerrillas.typepad.com/globalguerrillas/2004/05/index.html>



Given the potential for such extensive damage via a terrorist-controlled microlight, sufficient effort must be carried out to ensure that such a threat is neutralised





AIRPORTS AND TERRORISM

Introduction

The chances of success or failure for a terrorist to launch a successful aviation strike in the air are greatly predetermined by what takes place on land. Airport security, to a great extent, forms the greatest hurdle for a successful terrorist attack and thus remains the best and often times last option for a terrorist attack to be identified and thwarted by the authorities.

Security of Airports and Airstrips

Controlling access to aircrafts, airfields and certain sensitive airport facilities is highly essential. Reports from the US show that prior to 9/11, there were numerous instances during which special agents using fictitious law enforcement badges and credentials were gaining access to secured areas, bypassing security checkpoints at major airports and walking unescorted to aircraft departure gates.¹ There is also the possibility that attacks on airport terminals and airline offices can form a greater threat in current times rather than aircraft hijackings.² It is pertinent to note that Indonesian-born Singaporean terror fugitive, Mas Selamat bin Kastari, who recently escaped from detention in Singapore on 27 February 2008, was suspected of plotting to bomb Singapore Changi Airport in 2002.³ Further investigations confirmed that he had initially planned to do so by crashing a plane into the Changi International Airport.⁴

¹ Statement of Gerald L. Dillingham, Director, Physical Infrastructure Issues during his testimony entitled 'Aviation Security : Terrorist Acts Demonstrate Urgent Need to Improve Security at the Nation's Airports' before the Committee on Commerce, Science and Transportation, US Senate on 20 September 2001

² Paul Wilkinson in an interview published in the International Herald Tribune after the hijacking of the Kuwait Airlines in April 1988, 'Evolution of Aviation Terrorism : Sabotage Bombing', Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007.

³ Singapore JI suspect nabbed in Java, The Star, 6 February 2006

⁴ "JI detainee Mas Selamat Kastari escapes from Singapore detention centre", Channel NewsAsia, 27 February 2008, http://en.wikipedia.org/wiki/Mas_Selamat_bin_Kastari

A similar situation occurred in Penang, Malaysia on 20 November 2006, when robbers masquerading as RELA (*Ikatan Relawan Rakyat Malaysia* or Malaysian voluntary corps) officers gained access into the Malaysia Airlines (MAS) Cargo Complex in Batu Maung and took RM 47 million worth of computer chips. The robbers apparently knew exactly what they were looking for and came in two container lorries to cart the stolen goods. It is also pertinent to note that the Airfreight Forwarders Association of Malaysia's Chairman, Walter Culas, had received an anonymous SMS claiming that a major heist would occur either at the Kuala Lumpur International Airport (KLIA) or the Penang International Airport. He had subsequently notified the authorities but that did not prevent the heist from taking place.⁵ The incident is significant as it clearly shows that security, particularly at critical areas which include airports, ground transportation to and from airports, ground servicing areas, airline offices, airport perimeters and in-flight security,⁶ need to be improved upon. It is also plain to note that if a robber can infiltrate these areas, a terrorist can, in most likelihood, do the same.

On 15 October 2007, *The New Straits Times* reported that a Palestinian national, Osama R.M. Shublaq, aged 27, had entered a Singapore-bound Boeing 777-200 (flight SQ 119) via the nose wheel on 11 October 2007 at KLIA. This security breach took place without being detected by closed-circuit television (CCTV) camera recordings. He was discovered after falling 2.4 m from the nose wheel, when the plane arrived at Changi International Airport, Singapore.⁷

Newspaper sources indicate that Osama was believed to have crawled out from one of the drains in darkness to get into the aircraft at about 9 pm on 11 October 2007.⁸ He then entered the restricted zone of KLIA by scaling two perimeter fences. Hence, the Transport Ministry's initial claims that there had been no intrusion along the airport's

⁵ 'Daring Raid', *The Star*, 21 November 2006

⁶ 'Al Qaeda in Aviation Terrorism, Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007

⁷ "Red faces over 'phantom' stowaway", *New Straits Times*, 15 October 2007

⁸ "Chan wants full report on stowaway", *The Star*, 15 October 2007

fencing was disproved.⁹ Local authorities initially claimed that they were still not aware how the stowaway had boarded the plane while affirming that “everything seems to be all right at the airport.”¹⁰ Malaysian immigration revealed that there were no records of the stowaway entering or leaving the country¹¹ but later retracted its claim when they discovered that the individual concerned had come in on a social visit visa on 15 September 2007. The reason for this ‘oversight’ was due to a slight difference in the spelling of Osama’s name given to Immigration when compared to the name which appeared in his passport.¹²

During the incident, the number of security guards at the airport area had been reduced because of the *Hari Raya Aidilfitri* celebration. It was reported that although there were numerous entry and exit points, there was an insufficient number of security guards to patrol the area during that time due to the holiday season. It is estimated that approximately 8,000 people move in and out of the cargo complex daily and checks on visitors are done manually and with negligible CCTV surveillance in the area.¹³ This lack of security at critical and sensitive areas, particularly at airports, was also both observed and reported to the author, during the course of his study.

The incident revealed the significant fact that the Palestinian national, without any form of planning or external assistance, was able to avoid both electronic and manual forms of detection at the nation’s premier airport and was only detected when the plane landed in Singapore. What was also disturbing was that even after the whole incident had taken place, the relevant authorities were still initially unsure of how the breach had happened.

On 9 April 2008, *The Star* reported that a Bangladesh airliner on its way from Kuala Lumpur to Dhaka made an emergency landing in Bangkok after a Bangladeshi

⁹ “Osama had a valid tourist visa”, *New Straits Times*, 20 October 2007

¹⁰ “How stowaway did it still a mystery”, *New Straits Times*, 16 October 2007

¹¹ “Red faces over ‘phantom’ stowaway”, *New Straits Times*, 15 October 2007

¹² “Osama had a valid tourist visa”, *New Straits Times*, 20 October 2007

¹³ “How stowaway did it still a mystery”, *New Straits Times*, 16 October 2007

passenger; Harun Rashid Hassan Ali had slipped a fruit knife undetected into the plane, subsequently causing panic among passengers.¹⁴ It was further reported on 11 April 2008 that three Malaysia Airports Holdings Berhad (MAHB) staff were suspended over the security breach by inadvertently allowing the knife to slip through security checks at KLIA. There was also confusion over the jurisdiction of the security breach, when a transport official mentioned that the particular area in which the security breach took place was 'not under the jurisdiction of the MAHB' but was instead a 'public zone' which fell 'under the jurisdiction of the police.'¹⁵

On 10 April 2008, *The Star* reported how armed robbers shot five people in a three-minute heist at KLIA and escaped with RM 3.5 million.¹⁶ It is also pertinent to note that *The New Straits Times* reported on the following day that the closed-circuit television cameras outside KLIA were not switched on during the shoot-out.¹⁷

Past incidents of such security breaches in Malaysia include:

- Shamsul Ramli, a 16-year-old boy whose body was found in the wheel bay of a Malaysia Airlines Boeing 747 which landed in Johannesburg, South Africa on 15 March 1993. Investigations later revealed that he had climbed into the wheel bay of the aircraft which was parked at the Subang International Airport;
- Arif Salleh, a 25-year-old mental patient, was caught sitting in a parked, empty Boeing 737-400 which had arrived from Penang, at Bay 20 of Terminal One in Subang on 31 March 1993;
- Johari Kasmin, 25, was detained by a guard near the MAS clinic at Subang Airport Complex A after he hitched a ride in a van from Terminal Two on 8 April 1993;
- Phuah Ang Huat, 38, was detained by guards on 10 April 1993 when he gave Malaysia Airports Holdings Berhad (MAHB) guards and customs officers the slip

¹⁴ Passengers disrupts flight from KL to Dhaka, *The Star*, 7 April 2008

¹⁵ 3 suspended over security breach, *New Straits Times*, 11 April 2008

¹⁶ Robbers shoot five at KLIA, *The Star*, 10 April 2008

¹⁷ CCTVs not switched on during shoot-out, *New Straits Times*, 11 April 2008

- by dashing into the departure hall. He claimed that he was on a mission from God;
- Chandrasekaran Karuppan, 37, was arrested on 20 April 1993 after he ran into the baggage section at Terminal One of Subang Airport;
 - Shopkeeper Rahaman Saar V.A. Sultan was arrested by airport guards for intrusion at the Penang International Airport departure lounge on 27 April 1993;
 - An 18-year-old stowaway was found hiding in a plane at the airport in Subang in December 1994;
 - A teenager was found hiding beneath an aircraft at Terminal One; also in December 1994; and
 - Indonesian, Hapsah Abdul Kadir, was found on-board a Malaysia Airlines flight bound for Kota Kinabalu without a boarding pass on 11 March 1995.¹⁸

In general, most airports, in particular the smaller ones, lack efficient airport perimeter security.¹⁹ Hence, there is a possibility that smaller airports can be used as a launching strip for planes or experimental aircrafts within or beyond the shores of a country. Among the issues that warrant attention are:

- Allowing individuals who charter flights to be brought right to the tarmac to enter the airplane without any form of security check conducted on them;
- Entering the hangar of airports with minimal security vetting;
- Manning of the numerous entry points by various entities, both private and government;
- Studying the security of the numerous smaller airports, store ports, airstrips, and flight parks is imperative. While the concentration of security is on major airports, these sites can be a very viable target for terrorists to launch their operations. These sites have been well-documented by flying enthusiasts and information with

¹⁸ "First serious incident at KLIA", New Straits Times, 15 October 2007

¹⁹ 'Evolution of Aviation Terrorism: Hijack', Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007

regard to them is readily available on the internet, which subsequently means that such information (i.e. exact location, condition of the airport/airstrip) is known to all who are interested, including, of course, the terrorists.

The possible prevailing weaknesses in ground airport security are as follows:

- Human fallibility: airport security officials, particularly those manning entry and exit points, need to be diligent in screening whoever enters these secure sites;
- Complacency: the notion is that since terrorists have yet to infiltrate airports, it can therefore never happen; and
- Variable levels of airport security: particularly between smaller and bigger airports, whereby the prevailing notion is that smaller airports are not viable terrorist targets or conduits for terrorists.²⁰

²⁰ 'Al Qaeda in Aviation Terrorism, Introduction to Aviation Terrorism and Security, Certificate of Terrorism Studies, University of St Andrews, 2007





AVIATION SECURITY AND POSSIBLE SECURITY MECHANISMS

Hypothetical Scenarios Involving Aviation Terrorism

In his 1994 novel, *Debt of Honour*, Tom Clancy wrote of how a fuel-laden plane was hijacked by terrorists and intentionally flown into the Capitol building in Washington, D.C. with the purpose of killing the American President. It was perceived then to be just what it was supposed to be - a work of fiction - until 11 September 2001.

Given the current security climate and the prevailing security mechanisms, there is a possibility that such previously thought 'impossibilities' can happen. Among the possible scenarios are as follows:

Microlights flown by terrorists being crashed into critical infrastructures

Given the simplicity in operating microlights, its relatively low cost and the ease of obtaining one, the microlight is an evident choice for terrorists. Due to the short runways that are necessary for take-offs, microlights can be launched from numerous spots within a country. Its ability to hover three to four feet above ground and its unique design allows it to evade radar detection. Given its payload capacity of approximately 150 kg, it is well poised to carry sufficient explosives to cause considerable damage. Hence, it is very well possible for such a craft, piloted by a single terrorist and laden with explosives, to target critical and iconic infrastructure or even industrial areas/petroleum plants.

Microlights flown by terrorists being crashed into a descending or ascending airplane

Given all the advantages of a microlight as mentioned earlier, the craft can also be used to target descending or ascending planes. The terrorist in the microlight needs only to target the fuel tanks of the planes or to be close enough to the airplane's turbine to be sucked in. Given that microlights have the capability of achieving high altitudes of up to 10,000 feet, another method is to position itself in the flight path of an oncoming plane. Falling debris from a mid-air collision can also cause extensive

damage as seen in the Lockerbie tragedy, where falling debris killed eleven people on the ground.

Terrorists commandeering joy-ride flights and crashing them into critical infrastructure or descending/ascending airplanes

Joy-ride flights and chartered flights in numerous countries allow individuals to experience the skies in two-or four-seater planes. A discerning terrorist can exploit this situation, as in numerous cases, no security screening is done for those wanting to go on such flights. Therefore, while a passenger in a commercial plane is subjected to numerous screenings (metal detector, physical checks) a passenger in a joy-ride flight enters into the plane with no screening whatsoever. Also, unlike commercial planes, there are no physical barriers i.e. intrusion-proof doors that separate the pilot in the cockpit from the passengers. Hence, a terrorist can easily commandeer the craft and then resort to crashing it.

Terrorists chartering flights and crashing them into critical infrastructure or descending/ascending airplanes

Unlike the joy-ride flights, chartered flights travel across greater distances. There is at present organisations providing clients with door-to-door services, during which the client is brought from their house right up to the tarmac of the awaiting jet. The security clearance that they have to undergo is vague and not properly documented. Hence, terrorists can charter flights and either commandeer the craft or even use their own pilot from the very beginning. These small jets with considerable fuel storage can cause extensive damage and by the time those responsible realise that the plane is off-course, it would be too late.

Terrorists infiltrating airports, airstrips, flight parks and hijacking/sabotaging airplanes

Numerous security breaches have occurred within the airport perimeter and other critical areas in numerous countries involving robbers and stowaways. Given that

situation, it is significant to consider terrorists utilising the same modus operandi to either hijack or sabotage airplanes.

Terrorists being trained in flying schools for flying and aircraft maintenance

Suspected terrorists have been known to use other countries for flight training as seen in the case of the World Trade Centre bombings on 11 September 2001. There is also the possibility that terrorist groups might utilise training received for aircraft maintenance for other ulterior motives.

The hypothetical cases presented above are not purely academic in nature, but given the current situation, they have the potential to occur. Based on what has been observed, there is an urgent need to take cognizance of these factors in formulating adequate safeguards so as to prevent any outward incidents.

Possible Security Recommendations

In coming up with recommendations to improve the overall security of the aviation field, these questions need to be considered:

- What problems do the security measures solve?
- How well do the security measures solve the problems?
- What other problems do the security measures cause? (this is due to the fact that security is a complex and inter-related system in which one change can cause a ripple effect causing unintended consequences in other areas)
- What are the economic and social costs? (It is pertinent to note that costs are not merely financial but can also involve social costs. For example, profiling passengers according to a certain ethnicity or religion is a sensitive issue in Malaysia).
- Given all the above, is it worth the cost? ¹

¹ Bruce Schneier, Counterpane e-newsletter, 15 April 2002 as quoted in Andrew R. Thomas , Aviation Insecurity : The New Challenges of Air Travel , Prometheus Books, 2003, p.188.

Considering the complexities involved, the finite resources available and the tremendous security landscape that needs to be covered, there is a need to better involve the stakeholders, among which is by means of:

The involvement of potential flying students and flying enthusiasts:

- Issuance of certificate of good conduct/good behaviour as a criterion for potential flying candidates ; and
- Adherence to the 'no-aerial' photography rule for all flying enthusiasts.

The involvement of flying schools and clubs:

- Positioning flying clubs and schools as the 'first line of defence' when dealing with the issue of aviation terrorism;
- Conducting personality and psychological evaluation for all potential flying candidates;
- Including security elements in interviews for all potential flying candidates;
- Scrutiny of banking statement of all potential flying candidates;
- Transmission of information with regards to the dismissal of students/instructors to the DCA; and
- Ensuring that flying schools and clubs maintain meticulous records of students.

Involving the flying authorities and other relevant bodies

- Conducting both positive and negative vetting for all potential flying candidates;
- Checking the passports of all potential flying candidates;
- Conducting repeated security vetting and monitoring of pilots in Malaysia;
- Providing a security checklist to flying schools and clubs for enrolment of potential students;
- Publicising the security procedures with regard to flying and flying-related activities by relevant agencies;
- Establishing a DCA security hotline for reporting suspicious behaviour/activity;
- Initiating discussions between various players with regard to aviation security at regular intervals;

- Including a security element for aviation doctors screening potential pilots ;
- Conducting closer scrutiny of joy-ride flights;
- Initiating the establishment of ‘no-fly zones’ and counter-measures if such zones are breached;
- Ensuring the security of both small and large airports, airstrips and flight parks;
- Issuing of Certificate of Clearance by the DCA for all incoming microlight/aviation related purchases; and
- Monitoring of existing pilots.

THE INVOLVEMENT OF POTENTIAL FLYING STUDENTS AND ENTHUSIASTS

Issuance of Certificate of Good Conduct/Good Behaviour

The Certificate of Good Conduct/Good Behaviour is to be issued by the respective embassies of all foreigners wanting to learn to fly. This is to ensure that individuals who are wanted or blacklisted in their respective countries are not allowed to learn to fly.

Also, recommendation letters from previous institutions of learning and former employers would be a necessary requirement for all potential pilots (particularly local pilots) wanting to learn to fly.

Adherence to the ‘No-Aerial’ Photography Rule

Although there is a ‘no-aerial photography’ rule, it is often times not adhered to due to lack of enforcement. In some cases, flight operators take the liberty to allow aerial photography during ‘discovery flights’ or ‘joy-rides’ for tourists wanting to fly over the city. Hence, efforts must be made by the DCA to ensure a system of monitoring, either in the form of spot checks or encouraging tip-offs from the general public.

THE INVOLVEMENT OF FLYING SCHOOLS AND FLYING CLUBS

Flying operators as the First Line of Defence

To study the possibility of initiating a programme that will automatically enrol the flying instructors at both the club and school levels as the 'eyes and ears' of the local DCA, whereby their active cooperation and participation, particularly in the area of security, is institutionalised. It is significant to note that in the case of Zacarias Moussaoui, he was detected and reported to the FBI by personnel from the flying school that he was attached to.²

Given the lack of resources between the police and the DCA in most countries, it would also be advantageous to get the assistance of all flying clubs and schools in providing such vital security information.

Conducting Personality and Psychological Evaluation

The purpose is to ascertain the personality and psychology of the individual wanting to learn flying and to ensure that the individual is not a threat. Certain questions can be crafted to identify certain characteristics of violent, anti-social behaviour and also determine the psychological profile of the individual which can subsequently be used as indicators to initiate further investigation.

There can be tendencies in a terrorist which can be exhibited through his answers to some questions. There are many who doubt that a terrorist wanting to commit an act of terror will reveal something through a personality test. Nevertheless, skilled interviewers can be trained to pick up certain signs that can be revealed through such tests. However, it must be pointed out that should this procedure be implemented, there will be a need to design a suitable test and also to employ personnel to conduct and interpret the results of the test. There could also be the problem of 'false positives',

² FAA Security Took No Action Against Moussaoui', StarTribune.com, <http://www.startribune.com/722/v-print/story/59115.html>, 12 January 2002

whereby test results show the possibility of violent tendencies when in actual fact, there are none.

Including Security Elements in Interviews

The interviews currently conducted by flying schools and clubs before enrolling a potential pilot are for the express purpose of assessing the candidate's interest, capacity to learn and perhaps ability to pay the fees. At present, interviews for potential students wanting to learn how to fly are usually conducted by clubs and schools and do not include any security elements. It is pertinent to note that security elements embedded in the form of questions during the interviews can provide a significant opportunity to learn about the intention of the candidate wanting to learn how to fly. Given the fact that the interview will be conducted by non-security personnel i.e. the flying school/club, there is a chance that the candidate will speak more freely, allowing a trained interviewer to detect ulterior motives in that particular individual. Also, the interviews can be conducted after the personality and psychological tests have been carried out, allowing the interviewer to have a better picture of the potential candidate. Hence, it will be beneficial to include such a component in the interviews as an initial screening procedure. This security element can be standardised for all clubs and schools.

Scrutinising of Banking Statement

Another factor to be considered is the possibility of flying clubs and schools checking and monitoring the banking transactions of their students so as to ensure that there are no suspicious financial transactions. This is pertinent as numerous cases have shown that terrorists were able to operate through funding which, if initially detected, could have led to their arrest. In the case of Zacarias Moussaoui, the FBI was alerted by two officials from the Pan Am International Flight Academy based on his suspicious financial transactions.³

³ FAA Security Took No Action Against Moussaoui', StarTribune.com, <http://www.startribune.com/722/v-print/story/59115.html> , 12 January 2002

Hence, all potential students, both local and foreigners, who want to learn how to fly in a particular country, will have to sign a form allowing the club and school authorities to scrutinise their financial transactions. Since the permission to check the finance is given by the students themselves, the banking authorities are not involved, thereby averting the difficulty of involving banks (which have to content with confidentiality clauses), in the said process.

A pertinent issue to be addressed is the question of who will be monitoring financial transactions of the students. The flying schools and particularly the flying clubs may not want to or have the necessary resources to manage the monitoring. The police also may not have the necessary manpower to scrutinise financial transactions of all flying students. This can be addressed by engaging credit rating companies to check the financial backgrounds of those interested in learning how to fly.

The question of potential students not allowing for such checks due to privacy issues also needs to be considered. However, it must be noted that such checks are already routinely conducted, and in some cases, mandatory for some establishments.

Therefore, it is proposed that the clubs, schools or credit rating companies carry out the checks and any suspicious transactions are subsequently reported to the police. It is important to note that while this is not a full-proof method, it does, to some extent, make the job of the terrorist more difficult. Hence, this step could deter would-be terrorists from utilising a particular country as a launching pad, seeing that their financial transactions will now be monitored.

Transmitting Information with regards to the Dismissal of Students/Instructors to the Relevant Flying Authorities

At present, if a student or instructor is rejected or terminated, there is no mandatory need to inform the relevant flying authorities. Thus, a student/instructor, rejected by a flying school can go to another club or school and continue the process until he finds one that accepts him.

This point is significant, as a terrorist wanting to do harm and being rejected by a school/club can subsequently try elsewhere without having to fear that he can be caught. He can also then work on his 'mistakes' which caused him to be rejected in the first place and 'fine-tune' his efforts to ensure that he is accepted in the subsequent club/school.

Hence, there is a need for a mechanism in which, if a student/instructor is rejected or expelled, the club/school will have to immediately notify the relevant flying authorities on the reasons for the rejection or expulsion. Subsequently, if the authorities deem it necessary and warranted, they will then issue a directive for other schools/clubs not to accept that student/instructor if approached. This is important as it will allow the authorities to ascertain the intentions of the suspected individual and it will stop the individual from being accepted into other flying clubs/schools which might not have noted the suspicious behaviour.

Ensuring that Flying Clubs and Schools Maintain Meticulous Records of Students

Since some clubs are managed by elected committees and records are often misplaced or lost when new committees take over, there is therefore a need to ensure that all flying clubs/schools keep detailed and meticulous records of all students. Hence, a mechanism needs to be in place to ensure proper record keeping, particularly with clubs whose managing committee/s may change with the passing of years. A possible suggestion is to make it mandatory for a copy of all records to be sent to the relevant flying authorities for record and filing purposes.

INVOLVING THE FLYING AUTHORITIES AND OTHER RELEVANT BODIES

Conducting both Positive and Negative Security Vetting

There is a need to study the possibility of conducting both positive and negative vetting on all foreigners and a negative vetting on all locals wanting to learn how to fly. This is to ensure that besides checking their names against local, regional and international terrorist list databases such as International Police (Interpol), steps are

taken to actively investigate potential students. These steps should also be extensively publicised so as to dissuade would-be terrorists from wanting to commit any such acts in Malaysia.

Checking Passports of All Potential Flying Candidates

There is a need to study the possibility of scrutinising passports of all potential flying candidates so as to ascertain the places visited by the applicants. Subsequently, applicants who have visited certain 'high-risk' countries are to be highlighted and given a more thorough security vetting.

Repeated Security Vetting after a Certain Time-Frame

At present in some countries, if a foreigner is cleared the first time, there is no need for him to be vetted again even after a lapse of years. Hence, a foreigner can come into the country, undergo the security vetting, get his flying licence and then leave the country in question for a unspecified period of time and when he returns, he need not undergo any form of security vetting on the basis that he has already gone through it before. This is a loophole that can be exploited by terrorists.

Hence, there is a need to study the possibility for all foreign applicants to be vetted (negative and positive vetting) every time they seek to renew their flying licence, to ensure that they are 'clean'.

Providing a Security Checklist for Flying Clubs and Schools

It will be highly beneficial if the authorities can give flying clubs and schools training on what to look for when assessing a potential applicant's level of threat. This briefing can be followed by a checklist for all clubs/schools which provide the following:

- Security details to look into when accepting potential candidates (e.g. during the initial interviews); and
- Steps to be taken when confronting a suspected terrorist i.e. who to report to and what to do until the relevant authorities take over.

However, the disadvantage of such security screening is once again 'false positives,' through which the security vetting procedures would identify the potential applicant as a threat when in actual fact he or she is not. It must therefore be stressed that the security procedures proposed are not to be taken as conclusive and only indicate the possibility of an anomaly and the subsequent need for further investigation. Hence, the purpose of these procedures is not to ascertain if the potential candidate is a terrorist or otherwise. Rather it is an indicator of whether further checks are warranted on the potential candidate.

Relevant Agencies Publicising Security Procedures

The relevant flying authorities can actively project to both local and foreign potential pilots that anyone wanting to take up flying would be thoroughly scrutinised before being allowed into the programme. This aggressive campaign could dissuade potential terrorists from attempting any such schemes, especially when they realise that there are comprehensive security vetting procedures and security layers which are capable of detecting such schemes. This can also be demonstrated in the form of public relations exercise in which the flying authorities and other relevant authorities 'advertise' to all parties – both locally and internationally – the security steps being taken to ensure potential flying applicants are clean.

This is significant as terrorists are known to conduct research on countries which have easy access to enrolment into flying classes. If they are confronted with a comprehensive security vetting procedure, it is hoped that the country in question no longer becomes a viable place for the terrorists to carry out their plans.

There is a possibility that additional security vetting and procedures could dissuade legitimate candidates from learning to fly and this in turn will affect the flying business. It must be noted however, that should a terrorist learn to fly in a certain country and actually carry out an attack in any part of the world, the repercussions on the country in general, and its aviation industry in particular, will be catastrophic. For example, flying schools in the United States after 9/11 have been put under numerous restrictions

and their businesses have been severely affected. It is to avoid this that such preventive measures are being proposed.

Instituting a Security Hotline

There is a need to study the possibility of establishing a hotline by the flying authorities for personnel from flying clubs and schools, aviation doctors or the general public to alert the relevant authorities on suspicious behaviour of students, instructors or anyone else connected to the general aviation industry. This hotline number will then be prominently displayed at all airports, airstrips, flight parks, flight hangars, flying clubs and schools.

Efforts must also be undertaken to create public awareness and to encourage the various entities as well as the general public to report if they suspect something amiss. It would also be of utmost importance to ensure that an efficient reporting mechanism is set up and that all reports are treated confidentially, followed upon and action taken if deemed necessary.

Initiating Discussions between Various Players with Regard to Security at Regular Intervals

A loose formal/informal discussion/forum involving all major players (flying clubs, schools, police, aviation doctors, airport authorities, flying authorities and other relevant parties) should be initiated on a regular basis to review security matters such as those mentioned above.

This discussion/forum can also be used as a training session for flying clubs/schools, during which sessions on profiling, techniques on conducting security interviews and other relevant security-based themes can be explored. This forum can also be used to disseminate and inform all flying clubs, schools and relevant personnel on security issues, so as to ensure that those involved in the aviation field are both trained and well informed.

Including a Security Element for Aviation Doctors

There is a need to study the possibility of including a security element for aviation doctors conducting medical examinations on pilots, in which a series of questions can be asked by them to ascertain the psychological make-up of the pilot. In case of any suspicious behaviour, the aviation doctor will then notify the relevant flying authorities.

Closer Scrutiny and Tighter Security for Joyride Flights

There is also a growing awareness concerning the security component with regard to joyride flights or discovery flights which take passengers on an aerial tour. At present, the security criteria with regard to joyrides are vague. Most operators who provide such services do so with little regard for security. Among the pertinent questions that need to be looked into are:

- Who are allowed to operate joyride flights?
- Are there any physical security screening for passengers wanting to participate in joyride flights and if so, what are they?
- Who manages that security and what systems are there to monitor them?
- Are there any 'no-fly zones' with regard to joyride flights?
- Are there any security precautions in the aircraft to ensure that passengers do not have easy access to the pilot and cockpit?

In most countries, any individual is allowed to take part in joyride flights. The security screening for passengers in such cases must also be carefully assessed to see if there are any loopholes that can be exploited. In addition to that, the aircrafts for joyride flights, often fly over very populated areas. There is also very little or, in most cases, no protective barrier between the passengers and the pilot, thereby making the craft an easy target to be taken over.

To Establish 'No-Fly Zones' and Counter Measures if Zones are Breached

There is a need to study the current no-fly zones in sensitive areas and to ascertain that these are updated and cover all critically sensitive structures that would include:

- Urban cities and populated areas;
- Petroleum refineries;
- Stadiums; and
- Important landmarks.

It would also be significant to include a plan of action if these 'no-fly zones' are breached. Among the issues which need to be considered are:

- What actions should be taken if the 'no-fly zones' are breached?
- Who would have the authority to make such decisions?; and
- The amount of time taken for such action to be effective (e.g. if it takes a small commercial plane four minutes to fly off-course and crash into a building, action to deal with this threat must be within that time frame).

Ensuring the Security of Both Small and Large Airports, Airstrips and Flight Parks

Terrorists who in the past used airports as conduits to attack or sabotage aircrafts have now focused on airports as the primary target, as seen in the attack on the Glasgow Airport on 30 June 2007.¹ It must also be pointed out that whilst security at major airports is constantly emphasised, there is also a need to ensure that the security of smaller airports, airstrips and flight parks are equally looked into.

Certificate of Clearance from the Relevant Flying Authorities for All Incoming Microlight/Aviation Related Purchases

Currently, there is the possibility of purchasing microlights or aircraft components via the internet and having them shipped into a country. Once they arrive, the purchaser can then collect them from the Customs and subsequently assemble them.

¹'Airport Incident was Terrorism', BBC News, 1 July 2007, http://news.bbc.co.uk/2/hi/uk_news/scotland/6257846.stm

While it is normally a requirement for the purchaser to register with the relevant flying authorities before operating and flying the microlight, there is no assurance that the individual in question will comply, as there are no means to monitor his purchase. A possible mechanism to overcome this problem is to make it mandatory for all purchasers of microlights (and even aviation spare parts) to get a letter of clearance from their respective flying authorities (i.e. the DCA) before the Customs releases the goods. When the purchaser goes to the flying authorities for the letter of clearance, the relevant agency can, at that point, ascertain the individual's motive and reason for purchasing the product. The flying authority is also then aware that such a purchase has been made and can automatically register the individual and, if necessary, monitor the situation.

Monitoring of Existing Pilots

There is a need to carefully monitor existing pilots of carrier airlines and ensure that they do not pose a threat. It is significant to note that recent trends have shown the recruitment of well-established professionals in their careers into the field of terrorism. This specific pool is considered very attractive by terror groups because they are in positions which, if properly exploited, can cause extensive damage. Given the nature of the work of commercial pilots, they can be considered as prime targets for recruitment by terrorist organisations.

Conclusion

It is significant to note that due to the numerous ways in which a terrorist can exploit the aviation industry, the security put in place to deter such activities should also equally reflect such diversity. Hence, these proposed security mechanisms are intended to be broad-based, involving the various stakeholders within the industry.



CONCLUSION

Events in the past clearly show that the field of aviation is indeed a significant and strategic target for terrorism. There have been numerous attempts worldwide, both successful and unsuccessful, to use aircrafts as missiles to conduct acts of terrorism. The ease of flying different kinds of planes, particularly microlights, makes such forms of terrorism possible and plausible. This provides very compelling reasons for terrorists to utilise this particular avenue to conduct acts of terrorism.

It is also significant to note that over the years, numerous security breaches have taken place in airports. While in most cases there were no elements of terrorism involved, it is pertinent to note that such security breaches can be exploited by terrorists. It is a chilling but necessary reminder to note that terrorist organisations often times research their targets to look for vulnerabilities. Hence, it is a logical deduction that these past events which have occurred in airports and surrounding areas can arouse the attention of terrorists worldwide.

Past incidents have also demonstrated that there is no single security vetting procedure that is infallible. Hence, what is proposed is a layered security approach which is varied and diverse with the aim of involving players in the aviation field which goes beyond traditional security forces. These simple, practical and sustainable measures can be put in place and can, to a certain extent, minimise the possibility of terrorists utilising a country as a target or conduit for aviation terrorism.

It is also important to note that there are no steps which are completely foolproof. The measures recommended are to make it harder and tougher for terrorists to operate and succeed. While there is bound to be complications in the initial stages, it must also be pointed out that strategies which are broad-based and multi-layered stand a better chance to be effective and sustainable in the long run. However, these steps need to be attended to with a sense of urgency and importance or they risk being rendered impotent by bureaucracy and a sense of complacency.



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List of Abbreviations

AOPA	: Aircraft Owners and Pilots Association
ATPL	: Airline Transport Licence
BND	: <i>Bundesnachrichtendienst</i> (German Intelligence)
CCTV	: Closed-Circuit Television
CIA	: Central Intelligence Agency
CPL	: Commercial Pilot License
DCA	: Department of Civil Aviation
FAA	: Federal Aviation Authorities
FBI	: Federal Bureau of Investigation
GIA	: <i>Groupe Armee Islamique</i> or Armed Islamic Group
GPS	: Global Positioning System
KLIA	: Kuala Lumpur International Airport
LSA	: Light Sport Aircraft
MAHB	: Malaysia Airports Holdings Berhad
MAS	: Malaysia Airlines
MLVK	: <i>Majlis Latihan Vokasional Kebangsaan</i>
MTWA	: Maximum Take-off Weight Authorised
PFLP-GC	: Popular Front for the Liberation of Palestine—General Command
PLF	: Palestinian Liberation Fund
PPL	: Private Pilot Licence
RELA	: Ikatan Relawan Rakyat Malaysia
SEARCCT	: Southeast Asia Regional Centre for Counter-Terrorism
SPL	: Student Pilot Licence
SPM	: <i>Sijil Pelajaran Malaysia</i>





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