**AVIATION AND SAFETY**

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**Abstract**

*The article basically deals with the growth with the aviation industry from the ancient times. It further deals with the growth and development of the aviation industry in India. It also states the legislations for the safety of the passenger in airplanes. It also states various procedures involved in the safety measures of the passengers such as Aircraft maintenance, Directorate General of Civil Aviation (DGCA) compliances, Counter Terrorism, Airport Security, and Baggage Check. The article further states that how the Indian government is playing the key role internationally for the safety and protection of aviation industry as well as the passengers. The article further states that the safety of aviation is a two way programme i.e., technical safety as well as safety from crime.*

**AVIATION AND SAFETY**

Aviation is derived from avis, the Latin word for bird. Many cultures have developed devices which fly in the air from earliest projectiles like stones and spears to hot air balloons and kites which fly in the air along with man. There are stories of human flight such as the stories of Icarus, and Jamshid in Persian myth, and later, somewhat more credible claims of short-distance human flights appear, such as the flying automaton of Archytas of Tarentum (428–347 BC)[[1]](#footnote-1), the winged flights of Abbas Ibn Firnas (810–887), Eilmer of Malmesbury (11th century), and the hot-air Passarola of Bartolomeu Lourenço de Gusmão (1685–1724). The modern age of aviation began with the first untethered human lighter-than-air flight on November 21, 1783, in a hot air balloon designed by the Montgolfier brothers. However the balloon was only able to fly in the low winds which was recognized shortly and was replaced by elastic balloons. Jean-Pierre Blanchard flew the first human-powered dirigible in 1784 and he himself crossed the English Channel in one of them in 1785[[2]](#footnote-2).While there are many competing claims for the earliest powered, heavier-than-air flight, the most widely-accepted date is December 17, 1903 by the Wright brothers. The Wright brothers were first to fly in powered and controlled aircraft which was combination of earlier flights gliders controlled but not powered and free flight powered but not controlled[[3]](#footnote-3).

Now we come to India it is expected to be amongst the top five nations in the world in the next 10 years in the aviation sector. On the sidelines of the International Civil Aviation Negotiation (ICAN) Conference, Ms Pratibha Patel, President of India highlighted that currently, India is the 9th largest civil aviation market in the world[[4]](#footnote-4).The Ministry of Civil Aviation, Government of India (GOI), has decided to allow the Indian Scheduled Carriers including Air India to utilize the allocated bilateral till the time they reach the maximum permissible limit under Air Service Agreements (ASAs). Air India's operational plan will receive due consideration in allocation of the traffic rights and entitlements. The Ministry has also supported the approach outlined in the Inter Ministerial Group (IMG) discussion paper in this context. Keeping in view the recent developments in the civil aviation sector and in order to modernize and update the existing Air Services Agreements (ASAs) with foreign countries as per the ICAO templates, the Ministry of Civil Aviation has signed ASAs with Indonesia and Brazil, besides initializing ASAs with Jamaica, Dominican Republic, Mozambique, Uganda, Trinidad and Tobago[[5]](#footnote-5).

After the invention of Airplane safety of passengers in a flight is of foremost consideration. “One World-One Sky-One Mission: SAFETY” is the foremost consideration of the airport authority India. The ICAO (International Civil Aviation Organization) document 9859 chapter 12 lays down the requirement of issuing a Safety Policy by the service providers and establishment of Safety Management System (SMS) based upon the policy. The guidelines for Safety policy and SMS framework are also issued by ICAO document {ICAO Regional Workshop on SMS and State Safety Programme (SSP) Implementation}. Airports Authority of India had formulated and circulated its Safety policy in 2004 vide Aviation Safety Circular No. 2/2004 dated 8 March, 2004. Gaining the practical experience of last five years, we have updated our Safety policy indicating more clearly "How we do business here?" as mentioned in ICAO doc. 9859 chapter 12 page Nos. 138-139.

The Airports Authority of India states its safety policy as below[[6]](#footnote-6):

1. **Establishment:** AAI shall conceive, design, develop and effect changes to the Aerodromes, CNS systems, ATS systems, airspace and air traffic management and procedures involving all the stake holders for safe Air Navigation in the sky and for safe aerodrome operations.
2. **Safety Plans:** AAI shall make its country wide Safety Plans, and revise periodically throughout all its operational activities for enhancement of safety.
3. **Safety Management System:** AAI shall establish SMS - the safety levels of airspace and all aerodromes, identify hazards and lay down methods of risk assessments, risk mitigation, safety measurements, reporting, monitoring and reviewing and shall endeavor to maintain the safety levels of all aerodromes, ATS and safety standards of CNS facilities even if the traffic grows.
4. **Safety reviews:** AAI shall carry out safety reviews regularly at the specified periods of the ATS and Aerodrome operations, CNS standards involving the management at station level, region level and corporate level.
5. **Responsibilities and accountabilities:** AAI shall involve all its wings (Engg., CNS, Operations, ATM, etc.) by documenting explicit safety responsibilities and shall evolve a procedure of accountabilities from top management to the line managers.
6. **Safety culture:** It shall also involve the other stake holders, the regulator in the safety promotion in the sky and ground operations by practicing the laid down procedures leading to a safety culture.

Now basically there are two kinds of safety required in the aviation sector:-

1. Technical Safety
2. Refuge against crime

1. **Technical Safety:**

1. **Aircraft maintenance:** Aircraft maintenance is one of the most important subject when we talk about the safety of an aircraft. Aircraft maintenance is the overhaul, repair, inspection or modification of an aircraft or aircraft component.

Maintenance includes the installation or removal of a component from an aircraft or aircraft subassembly, but does not include:-

1. Elementary work, such as removing and replacing tires, inspection plates, spark plugs, checking cylinder compression, etc.
2. Servicing, such as refueling, washing windows.
3. Any work done on an aircraft or aircraft component as part of the manufacturing process, prior to issue of a certificate of airworthiness or other certification document.

Maintenance may include such tasks as ensuring compliance with Airworthiness Directives or Service Bulletins. Since aircraft maintenance is so important to safety, there are even numerous Aircraft maintenance institutions which have been setup worldwide which trains students to be certified airplane technicians. These mechanics works with airplane manufacturers and airlines to build, repair, and inspect aircraft to make sure they are safe for flight.

Aircraft maintenance may be categorized into two:-

1. Preventive Aircraft Maintenance, where equipment is maintained before break down occurs. This type of maintenance has many different variations and is subject of various researches to determine best and most efficient way to maintain equipment. Recent studies have shown that Preventive maintenance is effective in preventing age related failures of the equipment. For random failure patterns which amount to 80% of the failure patterns, condition monitoring proves to be effective.
2. Corrective Aircraft Maintenance, where equipment is maintained after break down. This maintenance is often most expensive because worn equipment can damage other parts and cause multiple damage.
3. **Directorate General of Civil Aviation (DGCA) compliances:** India has been found to be fully compliant with the international safety standards by an audit done by the Federal Aviation Administration (FAA) of the United States of America. Before permitting a foreign airline to operate in the USA, FAA of US, backed by the US legislation conducts an audit of the concerned country’s Civil Aviation Authority (CAA) / DGCA to ensure its capability for providing safety certification and continuing oversight on its international carriers. The audit is conducted under an ‘International Aviation Safety Assessment Programme’ (IASA) and focuses on the country's ability to adhere to standards and recommended practices of International Civil Aviation Organisation (ICAO) for aircraft operations and maintenance. Under the IASA programme, FAA in the year 1997 had conducted an audit of DGCA India and had awarded Category 1 status to India. This year, in March 2009, FAA, based on the report of an audit conducted by ICAO in October 2006, conducted a reassessment of DGCA. While the FAA’s IASA team found India to be compliant in areas of aviation legislation, operating regulations, civil aviation structure and safety oversight functions, and licensing and certification obligations, it raised concerns in the areas of adequate technical guidance for DGCA inspectors, hiring and retaining technical personnel in DGCA, establishment of an on-going surveillance programme of air operators and the resolution of identified safety issues.

**2.** **Safety against crime**

**1. Counter Terrorism:**  Counter-terrorism is the practices, tactics, techniques, and strategies that governments, militaries, police departments and corporations adopt to prevent or in response to terrorist threats and/or acts, both real and imputed. The tactic of terrorism (used by terrorists) is available to insurgents and governments. Not all insurgents use terror as a tactic, and some choose not to use it because other tactics work better for them in a particular context.

1. **Foreign Internal Defence(FID) :** Foreign Internal Defence is a participation by civilian and military agencies of a government in any of the action programs taken by another government or other designated organization to free and protect its society from subversion, lawlessness, and insurgency. FID is used by a number of western militaries, including the United States, France and the United Kingdom. It is used to describe an approach to combating actual or threatened insurgency in a Foreign State.
2. **Detentions in the US after 9/11 attacks:** After the attacks made by Al-Qaeda’s in U.S. detention process was started. This detention was a very harsh punishment made to a suspect terrorist. The government could do whatever possibilities way to open the mouth of the suspected to know all the informations related to terrorism. This detention process was in such a way that an accused could be detained without being produced at the court for a fair trial.

**2. Airport Security:** Airport security refers to the techniques and methods used in protecting airports and aircraft from terror attacks. Large numbers of people pass through airports. This presents potential targets for terrorism and other forms of attack due to the number of people located in a small area. Airport security attempts to prevent would-be attackers from bringing weapons or bombs into the airport. If they can succeed in this, then the chances of these devices getting on to aircraft are greatly reduced. As such, airport security serves several purposes: To protect the airport from attacks and to protect the aircraft from attack, and to reassure the traveling public that they are safe. There are two sides to an airport: the airside and the city-side. The airside is directly involved in the arrival and departure of aircraft and includes the runway, aprons, control towers, hangars, aircraft maintenance and refueling facilities, whereas the city-side constitutes commercial facilities around the airport for the benefit of passengers like development of property on the airports' land, building and maintaining car parking and cargo operations. "The goal of aviation security is to prevent harm to aircraft, passengers, and crew, as well as support national security and counter-terrorism policy."

EXISTING SECURITY MEASURES

Some countries may have an agency that protects all of their airports (such as Australia, where the Australian Federal Police is responsible for security at major airports), in other countries like the United States, the protection is controlled at the state or local level. The primary personnel will vary and can include:

1. A police force hired and dedicated to the airport
2. A branch of the local police department stationed at the airport
3. Members of the local police department assigned to the airport as their normal patrol area
4. Members of a country's military
5. Members of a country's airport protection service
6. Police dog services for explosive detection, drug detection and other purposes

**Other resources may include:**

1. Security guards
2. Paramilitary forces
3. Military forces

In India, the Central Industrial Security Force, a paramilitary organization is in charge of airport security under the regulatory frame work of the Bureau of Civil Aviation Security (Ministry of Civil Aviation Security). CISF formed an Airport Security Group to protect Indian airports. Every airport has now been given an APSU (Airport Security Unit), a trained unit to counter unlawful interference with civil aviation. Apart from the CISF, every airline has an aviation security force which is a separate department.

**3. Baggage Check:**  The list of items banned or limited by the TSA (Transportation Security Administration) from being carried on airlines includes things you might not think twice about carrying on board but upon which airport security screeners will hone in; sharp weapons are obvious no-no's, but things you may not consider dangerous weapons may be on the list, like spare lithium batteries do note that the lithium ion batteries in your cell phone and laptop are fine). For instance, pepper spray is a baddie; formerly banned fingernail clippers are now permitted (get a set without an attached metal file). If it can be used as a weapon, it's likely a no go. Some items, like ice picks, are a no-brainer no-no, but know that you must also check the hockey stick and corkscrew. I remembered the hard way in summer 2006 that lighters were banned, although lighters are once again okay as of August 4, 2007 (now that the TSA has deduced that the agency was spending millions of dollars and man hours confiscating up to 39,000 lighters a day). The TSA-banned items in your carry on can get you fined and even prosecuted, even if you brought them accidentally. In scenarios less common now than just after 9/11 airport security crackdowns, you may wind up on a no-fly list or be unable to board if you are carrying a banned item in your carry-on.

With the development of aviation industry and also increase in international crime and international terrorism we find that it is necessary to work in the sphere of the safety of the passengers. Mainly after 9/11 attack the world administration has started giving special attention to these issues. Secondly there are higher chances of technical defects and that is also the reason to increase the safety of aviation industry.

1. "Aviation: Reaching for the Sky". Don Berliner (1996). The Oliver Press, Inc. p.28. [↑](#footnote-ref-1)
2. http://en.wikipedia.org/wiki/Montgolfier\_brothers#Manned\_flight [↑](#footnote-ref-2)
3. "Aviation History". Retrieved 2009-07-26 [↑](#footnote-ref-3)
4. http://www.ibef.org/industry/aviation.aspx [↑](#footnote-ref-4)
5. Directorate General of Civil Aviation (DGCA), Press Releases, Media Reports, Outlook report by Centre for Asia Pacific Aviation, Ministry of Civil Aviation [↑](#footnote-ref-5)
6. The Safety Policy & commitment is approved and signed by the Chairman, AAI Vide Aviation Safety Circular No.2/2009 [↑](#footnote-ref-6)