Challenges facing airport management

Environment, Air

Air travel remains a large and growing industry. It facilitates economic growth, world trade, international investment and tourism and is therefore central to the globalization taking place in many other industries which results in various challenges the airport authorities are facing in the 21st century.

In the past 10 years, air travel has grown by 7% per year. Travel for both business and leisure purposes grew strongly worldwide. Scheduled airlines carried 1. 5 billion passengers last year. In the leisure market, the availability of large aircraft such as the AIBUS 380 made it convenient and affordable for people to travel further to new and exotic destinations. As the economies of developing countries grow, their own citizens are already becoming the new international tourists of the future.

There are various Challenges facing Airport management in the 21st Century. Different airports have different problems but one thing is for sure that some of the issues like the core issues remain the same. These are basically security of the airport especially after the 9/11 attack on US soils and the ic184 hijack in Katmandu. The rise in people travelling through the air travel has also lead to increase the facilities at the airport and new planes like A380 aircraft which results the airport to increase its infracture of the airport right from the runway to the passengers lounges to the aerobridges. As more and more companies are buying A380 there would be large requirement for the airports to upgrade their facilities according to the requirements. Bigger the infracture, more the passengers traveling bigger the facelift of the airport required and more up gradation of the facilities like parking of the passenger cars.

Let us start of with the various security issues the airports are facing around the world. Large numbers of people pass through airports. This presents potential targets for terrorism and other forms of crime due to the number of people located in a small area. Similarly, the high concentration of people on large airlines, the potential high death rate with attacks on aircraft, and the ability to use a hijacked airplane as a lethal weapon may provide an alluring target for terrorism.

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 crime and to protect the aircraft from attack, and to reassure the travelling public that they are safe.

Process and equipment

Some incidents have been the result of travelers being permitted to carry either weapons or items that could be used as weapons on board aircraft so that they could hijack the plane. Travelers are screened by metal detectors. Explosion detection machines used include x-ray machines. Explosive detection machines can also be used for both carry on and checked baggage. These detect volatile compounds given off from explosives. A recent development is the controversial use of full body scanners to detect hidden weapons and explosives on passengers. These devices require that the passenger stand close to a flat panel and produce a high resolution image. There are misunderstandings about how x-ray backscatter personnel

scanners function, but they do use ionizing radiation and the x-rays emitted from them penetrate skin as well as clothing. While the risk of cancer from a single backscatter check is probably low, the cumulative risk of repeated exposure to radiation is a threat to public health, especially for people working in the airline industry and frequent travelers. A technology released in Israel in early 2008 allows passengers to pass through metal detectors without removing their shoes a process required as walk-though gate detectors are not reliable in detecting metal in shoes or on the lower body extremities. Alternately, the passengers step fully shod onto a device which scans in under 1. 2 seconds for objects as small as a razor blade.

Generally people are screened through airport security into areas where the exit gates to the aircraft are located. These areas are often called “ secure”, “ sterile” and airside. Passengers are discharged from airliners into the sterile area so that they usually will not have to be re-screened if disembarking from a domestic flight; however they are still subject to search at any time. Airport food outlets have started using plastic glasses and utensils as opposed to glasses made out of glass and utensils made out of metal to reduce the usefulness of such items as weapons.

In the United States non-passengers were once allowed on the concourses to meet arriving friends or relatives at their gates, but this is greatly restricted now in the United States. Non-passengers must obtain a gate pass to enter the secure area of the airport. The most common reasons that a non-passenger may obtain a gate pass is to assist children and the elderly as well as for attending business meetings that take place in the secure area of the

airport. In the United States, at least 24 hours notice is generally required for those planning to attend a business meeting inside the secure area of the airport. Other countries, such as Australia do not yet restrict non-travelers from accessing the airside area, however non-travelers are typically subject to the same security scans as travelers.

Sensitive areas in airports, including airport ramps and operational spaces, are restricted from the general public. Called a SIDA Security Identification Display Area, these spaces require special qualifications to enter.

In some countries, specially trained individuals may engage passengers in a conversation to detect threats rather than solely relying on equipment to find threats. In the United States the TSA has run several dummy tests in several major airports to measure the success of catching people with bombs. In 2002, the TSA reported that roughly 60% of fake bombs or component parts to bombs were missed by covert screeners. In 2007, that percentage rose to 75%, although this increase alone is misleading. The tests are done by using undercover agents to carry fake bombs/parts in their carryon luggage and counting how many are successful with getting through security checkpoints. The TSA runs covert tests every day and when a screener misses an undercover agent carrying dangerous items, they are immediately sent to remedial training.

Throughout the world, there have been a few dozen airports that have instituted a version of a “ trusted traveler program”. Proponents argue that security screening can be made more efficient by detecting the people that are threats, and then searching them. They argue that searching trusted,

verified individuals should not take the amount of time it does. Critics argue that such programs decrease security by providing an easier path to carry contraband through.

Another critical security measure utilized by several regional and international airports is the use of fiber optic perimeter intrusion detection systems. These security systems allow airport security to locate and detect any intrusion on the airport perimeter, ensuring real-time, immediate intrusion notification that allows security personnel to assess the threat and track movement and engage necceassary security procedures. This has notably been utilized at Dulles International Airport and US Military JFPASS.

Developing countries like india which have a high rate of terrorists attack have a very extensive way of dealing with security of the airport. : Security at the Indira Gandhi International Airport has been revamped with the integration of anti-sabotage detection and intrusion systems of both international and domestic terminals along with the anti-terror commando squad.

After the commissioning of the world class T3 terminal on July 3 by Prime Minister Manmohan Singh, the security of the airport will be brought under a unified monitoring system known as the Security Operations Control Centre (SOCC).

Entry, frisking, scanning, baggage checking, anti-sabotage and quick reaction deployment will be brought under a single umbrella.

The new control centre, aided by improved scanning and surveillance software and hardware, will be monitored by the Central Industrial Security Force (CISF) which is the agency protecting the sensitive airport and its periphery.

The ambitious and much-awaited Perimeter Intrusion Detection System (PIDS) to secure 37 kms of the airport periphery from illegal intruders will also be connected to the SOCC, a senior airport security officer said.

With the security management of both the domestic and international terminals coming under an umbrella, the facility would enable a better coordination for security of passengers and other airport staff, the officer said.

A special squad of the National Security Guard (NSG) black cat commandos, stationed at a newly-built airbase next to the airport, will also be associated to the new control centre.

A host of new services like the Delhi Metro’s airport link will connect to the airport and hence the multi-tasking of security drills will grow manifold. The integrated security terminal will help in achieving the daunting task, the officer said.

The control centre will also monitor the almost 3, 000 CCTV cameras and 352 screening machines spread across the sprawling airport premises.

The new terminal would be able to handle as many as 34 million passengers per annum against the present 26 million, as it would have eight levels with a built-up area of 5. 5 million sq ft.

It would have a common check-in concourse with 168 counters and 24 mobile ones apart from the most modern ‘ five level in-line baggage system’ for faster processing.

Around 5000 CISF personnel will be deputed at the IGI airport in view of the new T3 terminal and the forthcoming Commonwealth Games.

Large Size of A380 Brings Large Challenges

The A380 is expected to impact the industry in two ways. On the one hand, the immense capacity of the aircraft opens up opportunities to increase passenger flow through airports without increasing the number of aircrafts. This is likely to enhance efficiency of airports as well as minimise unit costs, an important advantage considering the limited number of slots at airports. The flip side of this is that airports will need to restructure their facilities and invest heavily in infrastructure to enable future operations of the A380. However, it appears that many airports are more than prepared for the projected expenditure since they expect to gain multiple advantages from the future operations of the jet.

The sheer size of the Airbus A380 brings with it immense potential but equally big challenges. Currently, the greatest challenge facing the industry is the need to adjust their facilities to accommodate an airplane code F, when most of the major international airports have the required

infrastructure for aircraft code E. Although Airbus initially developed the A380 to operate on runways of code E standard, subsequent rulings by the International Civil Aviation Organization (ICAO) stated that it belonged to code F category and called for airports to expand their facilities to accommodate it. “ Hence, airports are spending millions of dollars for investment in this infrastructure,” says the analyst. “ However, regulators and the aviation industry representatives have now struck a compromise that allows airports to be certified for A380 operations while minimising capital expenditure and operational disruption.”

Overall, airports are divided in their attitude towards the A380 and the modifications it demands depending on their current position in international air traffic. While some airports feel they have no choice but to embrace the changes, some others are deciding on the feasibility of preparing their facilities and handling the jet after carrying out a cost-benefit analysis. The remaining airports fall into the category of those that voluntarily make the required adjustments in an attempt to increase the airport′s appeal in the international arena and thereby, attract new airlines operating the A380.

CHANGI MODIFICATIONS

CAAS is spending S$60m on modification works to get Changi Airport’s Terminal 1 and Terminal 2 ready for A380 operations. Besides modifying gate F31, CAAS has completed the expansion of one more A380-compatible gate holdroom in Terminal 2, gate E5. This includes the installation of an additional gangway and a third PLB.

Nine other existing gate holdrooms in Terminal 1 and Terminal 2 are being similarly modified. The future Terminal 3 will have another eight A380-compatible gates, bringing the total number of A380-compatible gates at the airport to 19. Each of the 19 gates will have three PLBs.

In addition, three out of four baggage claim carousels serving A380 flights in Terminal 2 have been extended to accommodate more luggage, while two A380-ready baggage claim belts in Terminal 1 will be ready in 2006. Other modification works will include the widening of runway shoulders as well as runway-taxiway and taxiway-taxiway intersections.

Besides making modifications to existing infrastructure, CAAS has constructed two new freighter aircraft stands and two remote aircraft parking stands for A380 flights. Shields have also been installed along each side of a taxiway bridge to contain the effect of the A380 jet blast. Similar shields are being installed at another taxiway bridge at Changi Airport.

In preparation for the A380 operations at Singapore Changi Airport in 2006, CAAS has been carrying out modification work to the existing airport infrastructure as well as incorporating A380 requirements into the design and construction of Terminal 3. As the A380 aircraft is wider and heavier than the Boeing 747-400, Changi Airport’s airfield must be modified to the design requirements of the ICAO for Code F aircraft.

At Changi Airport, the existing runway length of 4000m and width of 60m meet the requirements for A380 operations. The existing separation

distances between runways, taxiways and nearest obstacles also meet the international norms specified for A380 operations.

However, the existing runway shoulders have been widened by 4. 5m on each side to allow the A380 aircraft to operate safely. The aircraft pavements at runway-taxiway and taxiway-taxiway intersections are being widened to allow pilots to manoeuvre the giant A380 aircraft safely at the turns.

“ CAAS is spending S$60m on modification works to get Changi Airport’s Terminal 1 and Terminal 2 ready for A380 operations.”

Shields have been installed along each side of a taxiway bridge to contain the effect of the A380 jet blast. Similar shields are being installed at another taxiway bridge at Changi Airport.

To facilitate passenger movements from the terminal buildings to the aerobridges, existing fixed gangways (which link the gate holdroom to the aerobridge) are being modified at the designated gates for A380 operations.

Each of these gates will be installed with an additional fixed gangway and a third aerobridge. They will also be enlarged to serve the increased number of passengers that the A380 will carry.

Two of the existing gates, F31 and E5, in Terminal 2 are now A380-compatible. Similar works have been scheduled to modify five gates in Terminal 1 and four other gates in Terminal 2.

Terminal 3 will have eight gates that can serve A380 flight operations when the terminal opens. In all, Changi Airport will have 19 enlarged gate holdrooms to accommodate A380 flights.

To accommodate the larger volume of arrival baggage from A380 flights, the presentation frontage of existing baggage belt carousels in Terminal 1 and Terminal 2 has been extended to about 90m.

Extensions to three of the four belt carousels in Terminal 2 serving A380 flights have been completed and in Terminal 1 two belts were lengthened in early 2006. Four belts in the upcoming Terminal 3 will be custom-made to serve A380 flights. Two new A380-compatible freighter aircraft stands and two new A380-compatible remote aircraft parking stands have been constructed.

Some of the key features of the new terminal are:

-Sixth largest in the world after those at Dubai, Beijing, Singapore, Bangkok and Mexico City

-One pier each for international and domestic operations spanning 1. 2 km from one end to other

-A city within, with a super-structure spread over 5. 4 million sq ft

-78 aero-bridges, against less than 10 at the current international terminal

-63 elevators, 35 escalators and 92 automatic walkways

-168 check-in counters and 95 immigration desks

-One pier each for international and domestic operations spanning 1. 2 km from one end to other

-Over 20, 000 sq meters of retail area, including a large food court

-Capacity to handle 12, 800 bags per hour, with 6. 4 km of conveyor belts

-Multi-layer parking facility that can accommodate 4, 300 cars

-Exotic plants, material imported from Thailand, Mexico, Bahrain.

The analysts were looking at GMR's work on Terminal 3 – aka T3 at Delhi Airport

– a symbol of the so-called " Modern and Bold India," considering it is among the world's largest airport terminals and constitutes the largest infrastructure asset in India today.

While the language may be a bit technical, it does give some insight into two important subjects:

a) how companies are assessed; and, more importantly from a " big picture" angle, b) the dynamics of Indian infrastructure growth.

For more on this crucial subject, see tomorrow's Featured Analysis,

which compares the dynamics of Chinese and Indian urbanization for the next decade and a half. Check notepad.

1. 3. 1 London Heathrow

London Heathrow will be used as the baseline airport in this study for several reasons:

_ Large number of expected A380 operations.

_ Extensive operational data readily available.

_ Arrivals and departures are always segregated.

_ Operation at close to runway capacity throughout the day.

Under

In November 2009 London Heathrow accommodated 4 daily Heathrow operations (2 ights

to Singapore, one to Dubai and one to Sydney), this _gure will rise substantially as Airbus

delivers more aircraft across the world given that Heathrow is a major international hub.

Heathrow is also likely be the base of operations for the 18 A380s to be operated by British

Airways and Virgin Atlantic. In addition to the volume volume of future A380 operations

Heathrow is a useful baseline airport given the wealth of data available about operations

at the airport as well as the simple operational modes of its runways. Heathrow always

operates one runway for arrivals and one runway for departures (to minimize the noise

impact on communities under the approach path [6]). Heathrow also operates close to its

runway capacity for most of the day due to slot controls at the airport. These factors

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together mean that a simple runway capacity model described in Section 2. 1 should yield

an accurate estimate of arrival capacity at Heathrow.

1. 3. 2 New York JFK

An American airport was included in the study in order to examine the e_ects of the more

stringent separation requirements impose by the FAA as well as the e_ect of the lower

aircraft size seen on average in the U. S. New York JFK (JFK) is likely to be one of the top

U. S airports in terms of A380 operations1. JFK is also an interesting contrast to London

Heathrow because its runways are frequently operated in a mixed-mode con_guration, with

arrivals and departures sharing the same runway.

Figure 3: New York JFK Airport Layout[7]

1. 3. 3 Dubai International

Dubai International Airport (DXB) was chosen as the third airport in this study due to

the potentially unmatched future level of A380 operations asa result of Emirates Airlines

1Los Angeles International (LAX) my handle more A380s however it was not used in this study due to

the complications imposed on A380 operations by its closely spaced parallel runways and the uncertainty

surrounding the resolution of these issues.

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(based at DXB) large order for 58 of the type (Figure 1). The airport also adds a third

distinct separation standard by applying the ICAO recommendations without modi_cation.

Like JFK, Dubai International has a pair of parallel runways assumed to be operating

independently with mixed arrivals and departures for the purposes of this study.