Airport Operations

Name

Affiliation

1. Introduction

Air transport is a dynamic part of a global transportation system. Functionally, organizationally and technologically air transport integrated into a multidirectional support a diverse market of passenger, cargo and mail (Kazda & Mark, 2007). Air transport is the fastest transport system which has ever been discovered. Consequently, air transport has been used to transport people, mail, and cargo nationally and internationally at a comparatively fast speed. Air transport is also regarded as one of the safest means of transport compared to road transport. The advantages of air transport as aforementioned are the main reason why air transport has attracted a high population of people who may want to travel or send their cargo across the borders. To facilitate air transport, airports are constructed to manage the outflow and inflow of aircrafts meant to transport the people, cargo, or services (Ashford, Stanton, & Moore, 1997). As the CEO of the new airport, it is important to learn from the failure of the old airport to provide services for all the available passengers. Consequently, the new airport has to be designed to accommodate the current 7 million passengers per annum and allow for the increase in passengers to 15 million per annum in a period of 20 years.

Due to the increase in the population of customers requiring air transport, the old airport has experienced many problems – congestion, delays, and insecurity among other problems are a frequent occurrence (Doganis, 1992). Due to technological advancements, security threats advance thus requiring more sophisticated measures in dealing with the security threats. It is therefore imperative to identify the functions and activities for successful operation and

management of the new international airport avoid problems encountered in the old airport and allow for expansion in future.

2. Functions and Activities required for the successful operation and management of an international airport

Air Traffic Control

Air traffic control is important to make sure there are no collisions or confusions in the aircraft routes in landing and departure. With 15 million passengers per annum in 20 years, the new airport should be very busy and should have air traffic control. The air traffic control includes controllers usually based on the ground and control aircrafts through radio communications. This is meant to ensure the safety of the people in the aircraft and can be used to communicate for rescue missions in case of complications in the air. This can be vital in complex operations which require traffic in all three dimensions. ATC stations in the airport may include apron control, clearance delivery and other ATC stations (Neufville & Odoni, 2003).

The Ground Control in the ATC system is given the mandate to direct all ground traffic in designated movement areas apart from traffic on runways. They give directions on the routes or ways the controlled traffic should use and where they can park. There are instances when vehicles, trucks, or aircrafts cross runways – they must get instruction from the ground ATC station on whether it is safe to cross runways. On the other hand, tower control directs aircraft on the runway and in the controllable airspace immediately controlling the airport. Radar technology can be used for communication between the pilot and the controller. It is also used in the location of the aircraft in 3D space position. The pilot may also report his/her 3D space position from the reading of the aircraft technology of space positioning.

Traffic Pattern

A traffic pattern in an airport refers to a specific pattern used by the traffic to depart or approach the airport. This is supposed to ensure a smooth flow of traffic and to avoid collisions and confusions. In most cases, the pattern should contain five legs forming a rectangle. The design of the traffic pattern should be designed in a way that will allow for accommodation of 7 million passengers and allow for an increase of the passengers up to 15 million passengers per annum in the next 20 years. A sample pattern is as shown in figure 1 below:

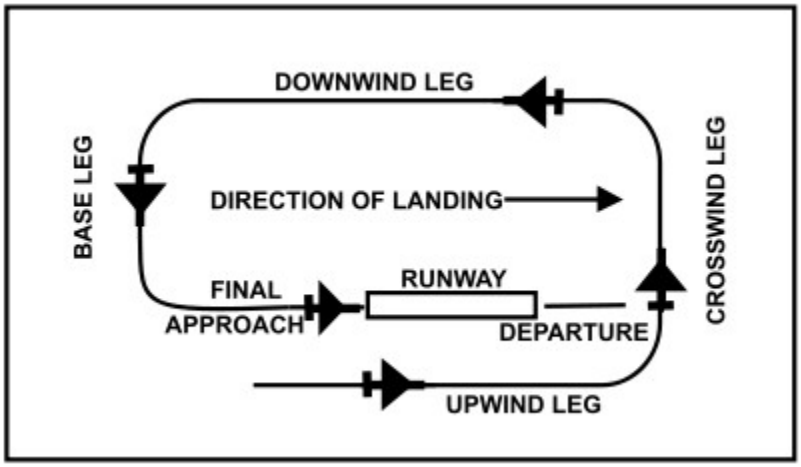

Figure 1: Sample Traffic Pattern

Navigational AIDS

Navigational aids are an important part of a busy airport. For instance, a Visual Approach Slope Indicator can be important to notify the pilots on the right time to start landing. Another important aid is the VHF omni-directional range which can help pilots locate the direction to the airport (Wells & Wensveen, 2004). The proper operation of the VOR can be supported by distance measuring equipment which is used in the determination of the distance of the VOR. The DMEs can be located off the airport to support in the distance information that can support

the location of the aircraft from the airport. The current technology has allowed finding the location of objects through the Global Positioning System (GPS) which can be used as the primary means of navigational aids.

Taxiway Signs

Apart from aircrafts, there are other motor vehicles used in the airports. Without proper control and signs, it can be unsafe to use airport routes and can also be unsafe to drive across runways. The taxiway signs are important in providing direction and information to taxiing aircraft and airport vehicles and trucks (Neufville & Odoni, 2003). With the large aircraft traffic expected to accommodate the growing number of passengers, it is imperative to place taxiway signs throughout the airport for proper direction and information to the drivers and pilots.

Lighting

For the large expected traffic, enough lighting must be available to guide planes on the runways and at night or in rain or fog. Enough of the lighting must be used to show the beginning of the runway and the end of the runway (Kazda & Caves, 2007). There should also be lighting that can be used in giving direction to show the center-line of the runway and the lights which help in indicating the approach.

Weather Observations

Safe flights depend on many factors. However, weather is a crucial part of safe landing and takeoffs at the airports. Consequently, an automated airport weather station is a crucial part of a secure airport (Graham, 2008). The weather reports can be sent over the radio or LCD

technologies can be used to visually show the weather conditions and warn or direct the people accordingly.

Safety Management

With the presence of highly flammable aviation fuel and other related safety situations at the airport, safety management is very important in a high traffic airport. Since the airport deals with international passengers, threats such as terror attacks, bomb threats, and hijacking are one of the most safety concerns in the airport (Kazda & Caves, 2007). For security concerns including human, latest technological infrastructure to detect such people must be installed and security personnel trained specifically for the purpose of the airport. They must also know how to coordinate with the government authorities because such security threats as terrorism are an international issue. Safety concerning friction of the runways must be dealt with by maintenance to ensure continuous friction for safe landing and takeoff. Although it is good to take up large spaces usually found in open-fields or wetlands, it is imperative for the airport personnel to ensure that birds do not nest nearby which might cause bird strikes which is insecure for aircrafts (Bluffield, 2009).

3. Organization structure showing the proposed management structure

The operations and activities for the proper running of an airport cannot operate without a properly coordinated management structure. The proposed management structure is as shown in figure 2 below.

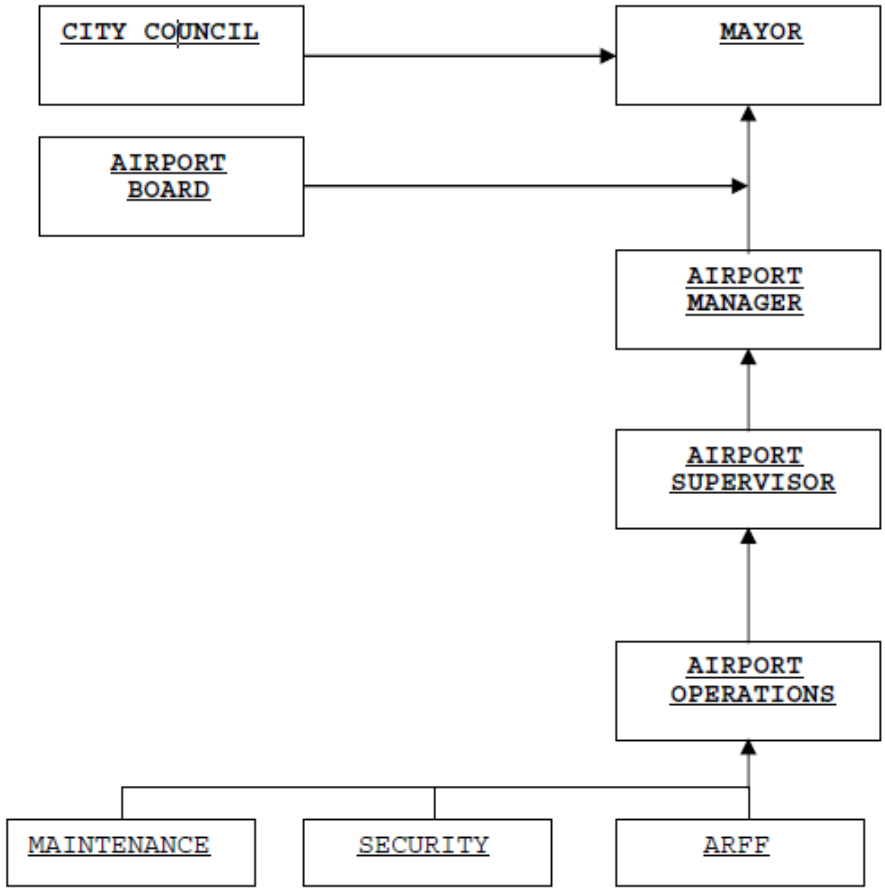

Figure 2: Airport Management Structure (Organization Chart)

The airport management is connected to the Mayor and the City Council because it deals with international passengers, cargo, and mail. Matters concerning security must be reported to the government authorities and the government must offer support in fighting security concerns through the airports.

Airport Board

The airport board is responsible for advising the Mayor and the City Council. This will ensure the proper positioning of the airport and improvement and expansion in case of insufficient

space. Through gathering information from the airport manager, it is important that the airport board necessary actions in advising for the next action (Graham, 2008).

Airport Manager

The manager is mandated to supervise the maintenance, equipping, administration, operation, regulation, improvement, and protection of the airport. This is in coordination with other airport support staff (Wells & Young, 2003).

Airport Supervisor

The supervisor is responsible for ensuring that he/she and the airport operations personnel maintain currency in the Aircraft Rescue and Fire Fighting (ARFF) and emergency first aid training. He/she is directly responsible for fire equipment operation and training support staff in its operation (Graham, 2008). The supervisor can be regarded as the chief of maintenance at the airport.

4. Functions which could be sub-contracted to outside third parties

The first function that should be sub-contracted to third parties is the safety management. Safety management is a broad category that requires well trained personnel to deal with security threats at the airports (Bluffield, 2009). It is imperative to note that there are companies that have well trained personnel who are ready to deploy their staff to deal with the safety problems at the airport. The first reason for use of subcontractors in safety management is the cost of training and acquiring safety equipments. Companies which already have safety detection equipments with cutting edge technology can be used given the work which they can train the airport personnel in operation or deploy their own trained personnel. The company chosen must have

understanding of the variety of threats posed at the airports and must know how to deal with international passengers, cargo, and mail.

There are safety measures concerning fire outbreaks and accidents – such emergencies should be subcontracted to emergency companies that have medical staff, emergency handling equipments among other measures to deal with airport emergencies (Wells & Wensveen, 2004). Weather observations can also be subcontracted to weather forecasting companies. The best weather forecasting companies can help fasten the implementation of weather reports for safe landing and safe departure.

5. **How the various functions and departments interact, and the impact of problems in one area can have other areas**

Safety management and weather observation are security measures to the passengers, pilots, and the inhabitants of the airport. For instance, in case of poor weather conditions which have not been reported and right measures taken, poor landing or departure can lead to aircraft accidents which can cause fire outbreak which requires emergency handling. The same applies to security threats such as hijacking and bombing by terrorists which results in people getting injured and thus requiring emergency attention and operations (Wells & Wensveen, 2004). Hijacking usually happen through the air and may cause redirection of traffic to other destinations and may require rescue through the use of other aircrafts.

6. **Order of Importance of Functions**

It is not true that some of the airport operations and functions are more important than others. The coordination of all the departments by every involved personnel is very important to make a successful airport. For instance, the failure of the safety management team could cause insecurity

in the airport leading to the fear of passengers meaning that there will be fewer or no passengers willing to use the airport (Neufville & Odoni, 2003). The failure of the weather observation means that the there will be insecure landing and departures at airport leading to the same question of insecurity at the airport. In addition, the failure of the lighting department will mean that flights during the night and those during rain or fog can experience problems which may create delays. The delays are very bad especially with the high passenger traffic. Consequently, customers will be lost and the targeted 15 million pax will not be achieved. A lack or inadequate taxiway signs means insecure driving through the airport. The vehicles and aircraft must flow in a designated speed and in the directions given and park in the directed spaces to avoid collisions. Crossing of runways requires safety information from the control room to ensure it is safe to cross at the specified time (Wells & Wensveen, 2004). The traffic pattern is important in addition to the control room instructions to avoid confusion. Without the traffic pattern, aircrafts could flow in all directions when they depart and when they land thus causing problems with the control room. Consequently, it is important for the cooperation of all the sections and the departments at the airport to ensure a smooth flow of the traffic in and out of the airport. As concerns the sub-contracted sections, they must work hand in hand with the airport personnel and ensure smooth operation of the airport functions.

7. Conclusion

Through identification of the functions and operations required at the airport, the airport management can be able to plan on the right people to handle the functions based on knowledge or experience of available personnel. When dealing with an airport, it is important to put in mind the possibilities of expansion or the increase of passenger handling – this makes planning easier instead of future impromptu expansions which might turn out expensive or destructive. It is also

imperative that none of the functions mentioned is more important than any other. The coordination of all the operations is important to meet the goals of the business especially by satisfying the customers. Customers at the airport are satisfied with efficient operations without delays or with minimal delays. They are also satisfied when they feel secure and uncongested at the airport. With proper design of the new airport and the functions and operations mentioned, the new airport can be able to handle the current traffic and allow for expansion up to 15 million passengers per annum in the next 20 years.

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