Unit 6: Airport operations and roles on economic and social

https://blog.airpaz.com/en/suvarnabhumi-airport-layout-and-guide/

Introduction

- The effective management of the facilities that exist on and around an airport's airfield is vital to the **safety and efficiency** of aircraft operations.
- Because of this, airport operations management represent many of the defining issues concerning airport planners and managers.

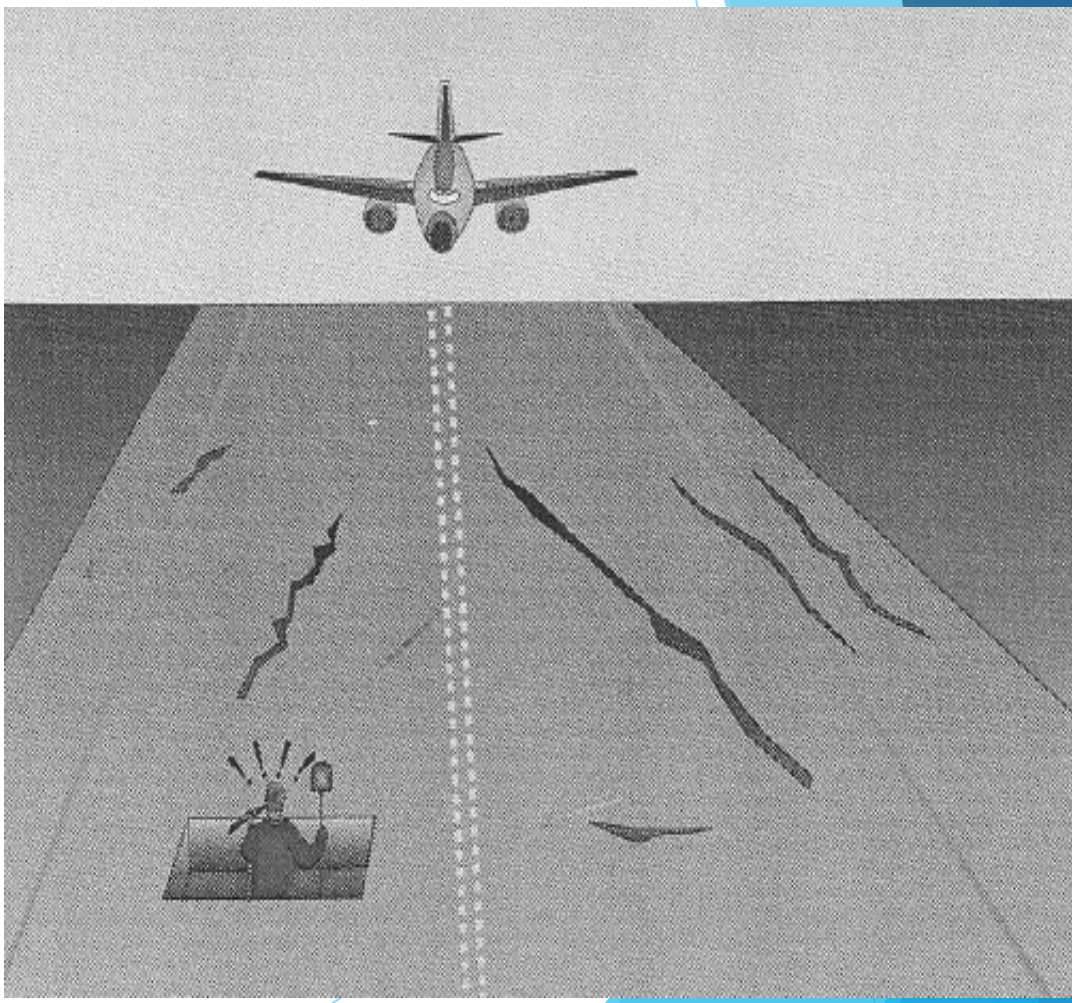
Airport Operations Management

Issues under FAR part 139 include:

1. Pavement Management
2. Aircraft rescue and fire fighting (ARFF)
3. Snow and Ice Control
4. Safety Inspection Programs
5. Bird hazard management

1. Pavement Management

- Pavement is surface section of runway/taxiway (concrete or asphalt).
- To serve its purpose, a pavement must have:
  - Adequate load-carrying capability,
  - Good ride ability
  - And must allow safe operation of aircraft.



Pavement Management

- Strong, level, dry and well-maintained pavement are required for the safe movement of aircraft.
- Minimum quality standard for runway pavements, including:
  - No holes
  - No cracks and surface variations which could impair directional control of an aircraft
  - No contamination such as mud, dirt & foreign object.

Pavement Management

- Inspection & maintenance of the runway/taxiway pavement are thus importance to airport management
- Actions in pavement maintenance are:

1. Pavement repairing: including sealing of small surface cracks. Purpose to ensure pavement always in good condition.
2. Pavement reconstruction: Adding an additional layer of asphalt to increase the strength of pavement. Replaced the pavement entirely. Expensive process.

pavement maintenance

Purpose of pavement maintenance are:

- To prevent further runway crack.
- To provide good runway surface friction.
- To increase safety by providing correct and clearly visible runway marking

Crack Sealing

2. Safety Inspection Programs

Timely inspections are important to maintain airport operational safety.

Areas under Safety Inspection Programs include:

- Runways
- Taxiways
- Apron-Aircraft Parking Area
- Fueling Facilities
- Buildings and Hangars

Safety Inspection Programs

The purpose of the inspection are to ensure these areas are free from:

- Foreign Object Damages (FOD) such as misplaced tools, aircraft parts and tyre debris.
- Hazards created by weather conditions (snow/ice).
- Hazards created by damaged facilities (unsealed runway pavements).
- Hazards occurring during construction activity (holes or obstacles).
- Bird or wildlife hazard.

FOD cases

Year 2000, FOD burst the tyre, damaged the aircraft's fuel tanks causing a fire of an Air France Concorde soon after taking off from Charles de Gaulle airport, Paris. 109 people were killed.

automatic FOD prevention systems

- **Radar, optical cameras or sensors:** can be used to locate foreign object once it is present on the runway.

The new FOD radar at Heathrow:
It is capable of
•Scanning up to 1km,
•Continuously sweeps a runway for hazardous objects and,
•Upon detection, uses camera zooms to identify the item.

3. Aircraft rescue and fire fighting (ARFF)

- All airports are required to provide ARFF services.

3. Aircraft rescue and fire fighting (ARFF)

- The objective of a rescue and fire fighting service is to save lives.
- ARFF important because aircraft accident occurring at area that there are the greatest opportunities of saving lives.
- ARFF capabilities at airport may mean the difference between life and death for pilots, all crews and passengers.

3. Aircraft rescue and fire fighting (ARFF)

- Under FAR 139, for any incidents of fires or emergencies ARFF have to RESPOND within 3 minutes.

- Normally foam are used because they can stop the fire efficiently. Basically, foam smothers the flames and cools the surrounding area to prevent further outbreak of fire.

Effectiveness of ARFF

- Intensive in-service training programs and live-fire drills are required to ensure ARFF personnel and equipment in top working order.

ARFF

- Typical ARFF Vehicles

4. Snow and Ice Control

Snow & ice control plan is established to ensure airport operations safety in the event of snow and ice conditions.

Procedures to follow are:

1. Timely removal of control of snow and icing.
2. Selection and application of approved materials for snow and ice control
3. Timely notification to aircraft when any portion of the pavement is less than satisfactory.

Icing Effect

- Icing is the accumulation of ice on the exposed surfaces of aircraft or on the surface of runway .
- Icing effect can cause problems to the aircraft thus can lead to accident.
- Ice forming on aircraft surface can cause aircraft loss of directional control, reduce aircraft performance and even can cause aircraft loss radio communications.
- While ice forming on runway makes slippery surface that can cause aircraft loss of control during

Snow and Ice Control

- Ice accumulation are potentially the most damaging weather phenomenon to affect airports.
- Methods to control ice on the pavement surfaces include the application of chemical solution (glycol) and snow removal equipment (plows, sweepers).
- The idea to use chemicals is that they react with the ice to produce a chemical reaction that produces heat. The heat melts the ice .
- And the snow removal equipment are able to loosen and plow the ice off of the surface.

Snow and Ice Control

- Anti-icing: To prevent ice from forming.

  The process of spraying a glycol solution on the parts of an aircraft to prevent the formation of ice

- De-icing: To remove ice after it has formed

  De-icing is the process of removing snow & ice from an aircraft surface or runway surface.

Why is snow and ice control important?

Snow & Ice control plan at an airport important because

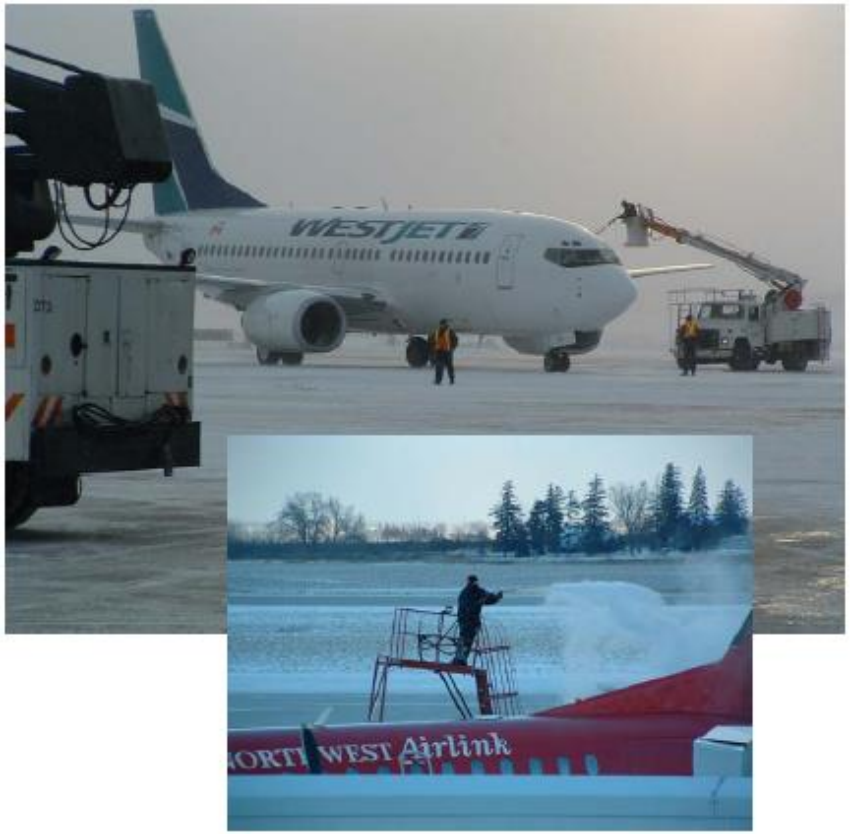
- To avoid accidents.
- To enable the aircraft ca
  emergency case.

  **Landing or taking off c
  surface is much more dan
  plane.
- To avoid flight delays.

Why is snow and ice control important?

- Winter weather can have a serious impact on safe airport operations, often resulting in conditions that may lead to incidents, accidents, or delays. For that reason, snow and ice control at an airport is extremely important, regardless of the size of the airport or the aircraft using it. Landing or taking off on a slippery surface is much more dangerous for a plane as aircraft brake is not efficient. Snow and ice control on the last third of the runway is especially critical, as this area must offer a clear pavement if a pilot decides to abort a takeoff.

Snowplows move the snow to the pavement edges where snow blowers disperse the windrowed snow



5. Bird hazard management

- Bird hazards especially near to airport has the big potential to cause serious aircraft damage and loss of human life.
- Every years there are many aviation accidents reported caused by bird hazards.
- Because of this, FAA directs any related airport to concern on bird and wildlife hazard management .



Bird hazard

- Federal Aviation Administration (FAA) released statistics indicating that the number of bird strikes reported in the US between 1990 and 2007, rising from 1,738 to 7,439.
- These strikes caused 3,094 precautionary landings, 1,422 aborted take offs and 312 engine shutdowns.

Bird hazard

- **Example: Bird Hazard That Caused The Tragedy at Brussels Airport, Belgium.**
- The Boeing 747 crashed after take-off when the right engine experienced a momentary loss of power because of bird strike.

Bird hazard

- US Airways Flight 1549 experienced total engine failure due to multiple bird strikes (flock of Canada Geese) no fatalities, 5 injuries.

Bird hazard Control Techniques

There are several control techniques available to solve the bird hazard problem. Some of the techniques are:

2. Elimination of habitat such as trees to discourage bird populations.
3. The ground crews must inform the A movements of birds detected.
1. Noisemakers tools, this tool will scare the bird and cause the bird to move away from airport.

NOTAMS

- **NOTAM is stand for Notice to Airmen**
- NOTAM is the notices containing updated information which is essential to personnel concerned with flight operations. The information including airport condition, or change in any component and any hazard.
- A NOTAM is filed with an aviation authority to alert aircraft pilots of any hazards at a specific location.

NOTAMs are issued (and reported) for a number of reasons, such as:

1. Closed runways
2. Inoperable radio navigational aids or lights
3. Military exercises with resulting airspace restrictions
4. Temporary obstacles near airfields (ex: Cranes)
5. Passage of flocks of birds through airspace
6. Notifications of runway/taxiway/apron status with respect to snow, ice and standing water.
7. Notification of an operationally significant change in volcanic ash or other dust contamination.
8. Hazards such as air-shows, parachute jumps, kite flying, rocket launches, etc.
9. Flights by important people such as heads of state

The airport roles on economic and social

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The airport supports the growth of business and industry by providing air connected for firms that must meet the demands, supply, competition, and market expansion.

The city without airport or sufficient air access have constraint on their economic growth.

1. The airport roles on economic and social

1.1 Economic impact of airport

1. Direct or primary impact
2. Indirect or primary impact
3. Induced impact
4. Catalytic impact

1.2 Social impact of airport

1.1 Economic impact of airport

Direct jobs by employment type by the presence of an airport.

4 Types of the economic impact of airport

Type of impact	Description of typical impact
Direct	The activities required to provide the product. Operation of airlines and airports (technical support and handling, catering, fuel, security and cleaning); commercial activities (shopping, restaurants, motor vehicle rental, parking); land transport and air cargo
Indirect	Sub supplies (goods and services) to direct activities that are covered in the region. Including; wholesalers providing food for in-flight catering, oil refining activities for jet fuel, accounting and legal services to airlines, travel agents booking flights.
Induced	Impacts of income generated by direct and indirect. For example, an airline employee might spend his/her income on groceries, restaurants, child care, dental services, home renovations which, in turn, generate employment in a wide range of sectors of the general economy.
Catalytic	a-Location impacts (firms and labour), e.g. industrial/commercial investment decisions; b- Tourism and trade (e.g. export markets) c- Productivity. Air transportation offers access to new markets which in turn enables businesses to achieve greater economies of scale while air access also enables companies to attract and retain high quality employees.

1.2 Social impact of airport

The aviation can have impact on social as well.

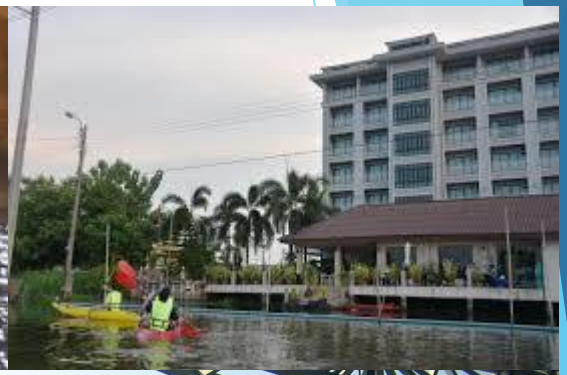
- Strengthening ethic and cultural links between countries
- Enhancing travel opportunities and increasing consumer choices for products
- Employment and living patterns will change with implication of housing, health, education and other needs on surrounding areas
- The airport can have major role in promoting social, such as remote and island communities' promotion
  - The remote area, without an airport would suffer and have minimize quality of life. Since, the airport can enable regions to have access to crucial services, for example hospitals and higher education

2. The airport and environmental impact

There are 5 main types of environmental impact at the airport *(Graham, 2014)*

1. Noise
2. Emission or air pollution
3. Water pollution
4. Waste and energy management
5. Wildlife, heritage and landscape

2. The airport and environmental impact



Source: www.dailymail.co.uk [Retrieved on November 22, 2016]

3. The airport relation with airlines and concessionaires

3.1 Airport-airlines relations

3.2 Airport-concessionaire relations

4. The airport and public relation (PR)

4.1 PR strategies

4.2 PR activities

4.1 PR strategies

Objectives of PR are to

- Introduce new products to manufacturers and consumers.
- Influence government legislation (ex. Boeing company try to encourage regulators that the two engines aircraft can fly nonstop international flights as long as 16 hours and as safe as four engines via PR activities).
- Enhance the image of an organization, city, region, or country.
- Call attention to an organization involvement with the community.

4.2 PR activities

The PR activities include;

- **Press release** is the report of some event or activity that organization sends to the media that it will be published for free.
- **Internal PR** is aimed to keep employees informed about objectives, success, or even plan to downsize labor. It includes newsletters and closed-circuit television.
- **Investor relations** is highly important public, since the financial support is critical for organization especially public company limited.
- **Lobbying** is referred to talking with and providing information to government officials in order to persuade them to vote on legislation or initiate legislation that benefit to organization.
- **Corporate identity** refers to logos, brochures that communicate a positive image of the organization

4.2 PR activities

The PR activities include;

- **Media relations** is crucial activity for PR department to develop close relationships with media
- **Sponsorships** refer to the activity which organization provide financial support to help specific event or issues, in return public would recognize the firm's contribution.
- **Special events** refer to a job of PR department in planning and implementing special event, such as a visit of distinguish guests.

5. The airport promotion and reduction

Today, the airport has become more proactive to develop a range of techniques to meet the needs and demand of mix clients (passengers, airlines, freight forwarders, tour operators, hotels etc.,).

Many airports have sought to attract new customers through marketing strategies. The marketing strategies and tactics were implemented, for instance relationship marketing, e-marketing, and social media.

The airport procures both tangible and intangible services to meet the requirements of all type of users.

Tangible services are;

- Airside infrastructure (taxiways, runways, ramp, apron, navigational aids),
- Landside infrastructure (terminals, ground transport, parking facilities)
- Airport support infrastructure (aircraft maintenance, in-flight catering services, security and police facilities)
- Support areas (industrial areas, duty free zone)

Intangible services are;

- Administration (airport management, airport planning, air traffic control)
- Operations (airport safety and security)
- Airport maintenance
- External factors ex. regulations and environment

5. The airport promotion and reduction

The airport products, seemingly, are the same. Hence, it is depending on promotion tactics of each airport to attract various users.

For example; The Singapore Straits Times (2015) reported that Singapore Changi Airport cuts fees for passengers, airlines to boost competitiveness details as follow;

"SINGAPORE - Changi Airport has cut charges for selected travelers, airlines and other partners amid intense competition from rivals in the region, including airports in Hong Kong and the Middle East.

Include lower passenger service fees for transit travelers, discounted landing fees for large aircraft and rebates for flight catering and other ground handling services.

5. The airport promotion and reduction

Include;

- Lower fuel prices
- Discounted landing fees for large aircraft
- Lower passenger service fees for transit travelers
- Cut charges for selected travelers to boost competitiveness
- Rebates for flight catering and other ground handling services
- Incentives - being offered to encourage staff to boost productivity