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DESIGN CONSIDERATION FOR AIRPORT TERMINAL BUILDINGS: KEY FEATURES.

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Abstract: This research represents various important parameters that are considered in the planning of terminal buildings. Understanding these parameters is crucial for designing an efficient and functional terminal building. The techniques described in this research have some advantages and disadvantages over the busiest schedule of any airport. Additionally, the paper explores different runway layouts and how these layouts influence terminal building design.

Index Terms- Terminal building, Centralized system, Decentralized System, Gate Capacity, Airport Layouts

I. INTRODUCTION

Passenger movement from the ground to the air generally occurs in the terminal area. Different methods are adopted to transfer goods and public which arrive at the terminal area. The terminal structure area depends on facilities provided for aircraft operation such as goods and public management which shows the effect on the working efficiency of the terminal site. The volume of airport operations, the type of aircraft, the number of gates, and passengers etc decides the degree of development in the terminal. Following are some of the important parameters that influence on utilizing factors of terminal areas.

Design objectives, for convenience design objective grouped into four categories. The first one is 'airline's objective' includes security, accommodation for aircraft staff, and use of the latest energy preservation. Airport management objectives, community objectives as well as passenger object are another major part of the design objectives. Secondly, facilities to be provided at the terminal building will depend on airport types and their functionality which includes the originating terminating station, and transport station. The third most important parameter that affects the terminal design is noise control due to the presence of passenger, aircraft movement and operational activities. For proper working of control ATC tower operations noise control management is important. Fourth one object is planning consideration, which includes centralized system in which baggage and cargo are monitored from a central location within walking distance. Another one is a decentralized system in which passenger facilities are divided into smaller parts and then arranged in one or more building units with gate positions. Lastly, site selection and space requirements are also important objectives that are considered during terminal area design. During the design of terminal areas size of the apron, several gates, parking system of aircraft must be considered.

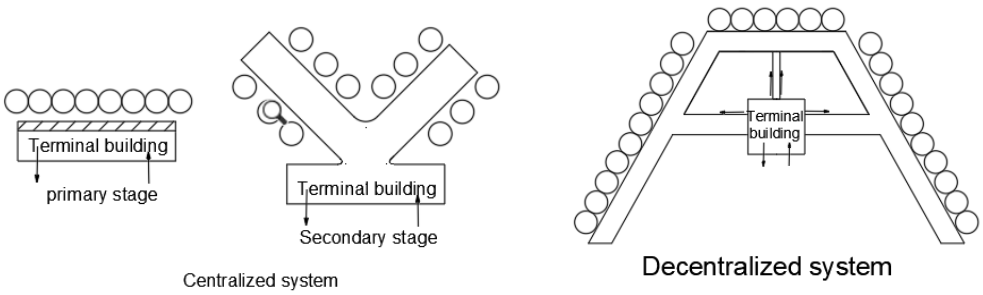

Fig.1:Aircraft parking arrangements.

II.RESEARCH METHODOLOGY

Following are the important factors which are considered during design and planning of apron and the layout of airports. We will understand one by one**.**

1. Size of apron: Before deciding the size of the apron following points must be understood.

A.) Gate position;

Aircraft parking space demoted parking positions respective to terminal building. Space required for parking as well as movement usually depends on aircraft size and parking types. The type of parking affects the gate size and position because they will be depend on the aircraft's parked position. The following table describes different positions of aircraft parking

Table 1; Aircraft parking system.

Parking types	Diagrammatical representation	Description
1. Nose- in parking		Aircraft nose is near the terminal building at a right angle, creating a low noise level, requires a small gate area
2. Angle nose-in parking		Similar to the above type but aircraft is not park perpendicular to the terminal building, create more noise level, required large gate
3. Nose- out parking		Aircraft parking is in right angle but tell position is near to the terminal complex, provide effective use of rear door
4. Angle nose-out parking		Similar to the above type but aircraft is not park perpendicular to the terminal building, create more noise level, have need of large gate
5. Parallel parking		In this type aircraft is park parallel to the terminal complex, be in need of large gate position, required large loading bridges

B) Gate positions number: From the above table we will understand various aircraft parking arrangements but other hand number of gates is also an important parameter that usually depends hourly flow of aircraft. A number of gates described capacity which is calculated by following the formula.

$G=(C\times T)/U$

Where

G=gate numbers

C=Design volume of aircraft per hour for arrival or departure

T=weighted average utilizing time in an hour

U=coefficient of gate utilizing factor. This method is applicable when aircraft are parked at gates position along the any gate of the terminal building.

C.) Various aircraft parking system:

Depending upon the adjacent horizontal terminal concept aircraft can be grouped near to the terminal building in various ways. This grouping is referred to as a parking system they are as follows.

1. Linear system; Also known as frontal system usually aircraft parking positions are parallel or in front terminal building in a linear manner. The simplest type of parking system adopted in low case of aircraft activities. Normally 3-6 aircraft access at the time not more than that. But offers high operating capacity.

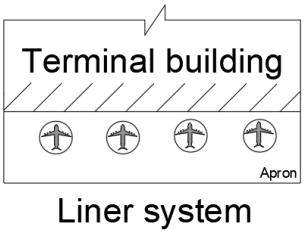

Fig.2; Linear system.

2. Transporter system (Open apron system): In this system, aircraft are parked in remotely located rows. Usually, aircraft are parked within walking distance which is more exposed to bad weather, noise, and hot jet conditions. The capital cost of the operation system is very low. If coordination of operation is not proper then a delay of aircraft landing or departure is observed.

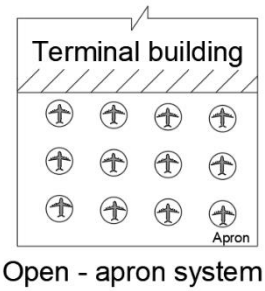

Fig.3; Open -apron system

3. Pier or finger type of parking system: It is further classified into three categories as T-shaped, Y-shaped, and Straight parking system. Economic parking system because more numbers of aircraft operate at a time.

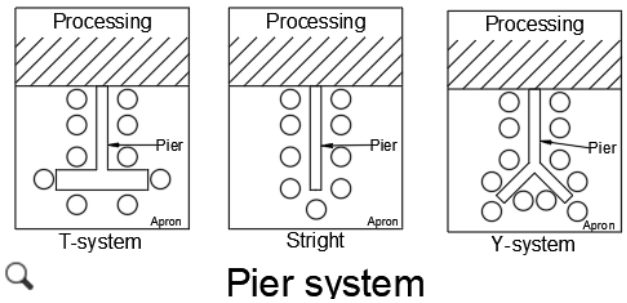

Fig.4; Finger system

2 Airport layouts

The layout selection of an airport is a critical decision, as it significantly impacts the smooth flow of aircraft traffic. Some fundamental patterns and configurations are considered when designing the airport layout, especially when compared to other elements of airport planning. Proper planning of the airport layout is crucial for efficient airport operations. The following are some key considerations in addition to the runway layout that are explained in detail with help of sketches.

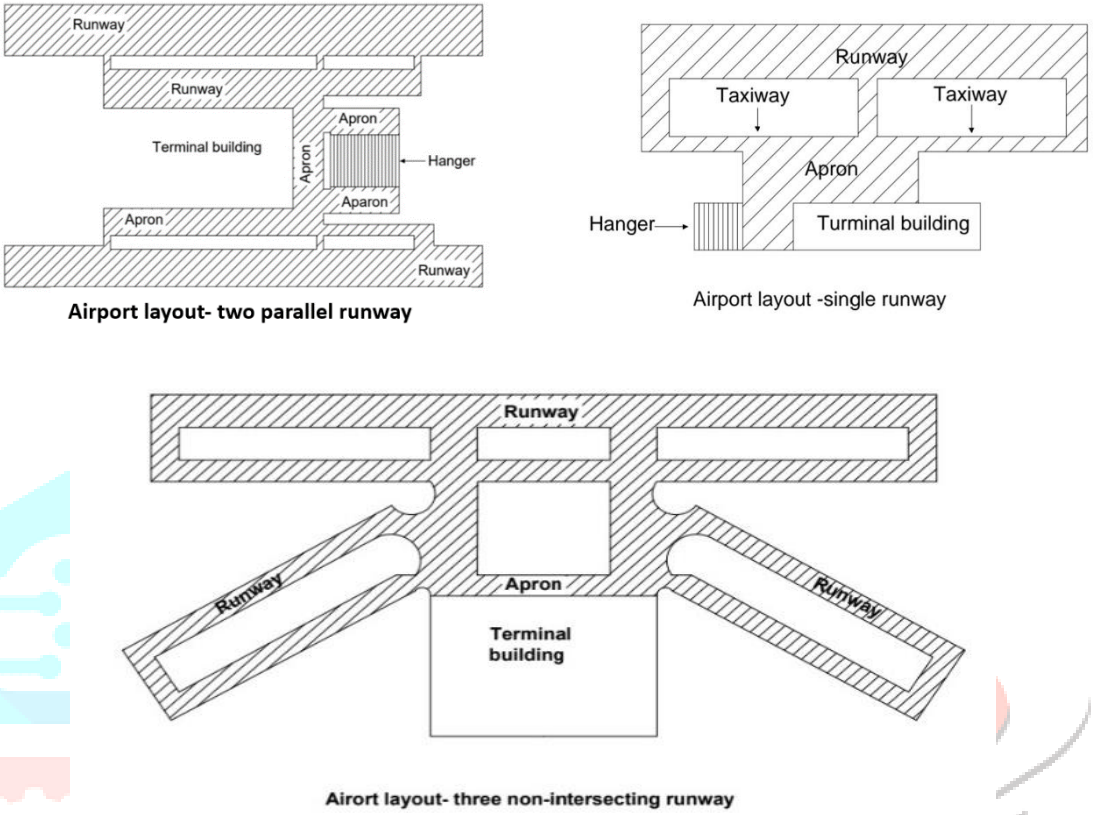

Fig.5; Various airport layout system

CONCLUSION

The design and planning of terminal areas in airports is a complex process that requires a comprehensive understanding of various parameters to ensure efficient airport operations. Properly designed terminal areas are crucial for the smooth movement of aircraft, which involves implementing different parking systems based on operational needs. Additionally, the arrangement of runway layouts should be planned to accommodate future expansions, allowing for seamless operations such as landing, taxiing, and takeoff without disruptions.

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