AIR TRANSPORTATION & DISASTER MANAGEMENT

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AHMEDABAD

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

AIR TRANSPORTATION & DISASTER MANAGEMENT

Contents

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Air Transportation & Disaster Management

BLOCK 1 : INTRODUCTION TO AIR TRANSPORTATION

INTRODUCTION TO AIR TRANSPORTATION

Block Introduction :

The link between tourist–producing and destination regions is provided by the transportation industry. However, the advantages of aircraft outweigh the drawbacks. Aviation has a significant impact in two key areas: connection and transportation. There are several reasons why air connectivity to a country's remote areas is crucial, including economic change, raising the standard of living, and many others. Because it creates a lot of jobs, raises living standards, and promotes sustainable economic growth, if we imagine or actualize aviation as a nation, it will be a major source of global economic growth. Rivers have been used for human and cargo transportation since the Indus valley culture.

Air travel is among the most significant types of transportation in the tourism industry. The way that people think about time and distance has changed significantly as a result of air travel. To meet the daily rising demand, airlines spend billions of dollars and implement new technical advancements. The air transport business is growing quickly thanks to its unrivalled importance in large distances.

Depending on the mode of transportation utilised and how frequently, transportation may or may not improve a tourist's trip experience. The carrier can be made into a separate component of a tourist attraction; the best examples of these are cruises, Orient Express trains, river boat excursions, and so on. road transportation Short distances are covered by other modes of transportation.

Block Objectives :

After understanding this block learns will have knowledge and its objectives is :

- To provide the learner with information about transport and its various means.
- To make learner understand about linkages between transport and tourism.
- To provide the learner with information about origin and growth of Airline industry.
- To make aware about role of Airlines in promoting tourism.
- To provide the learner with information and understanding of tourism as a trade and it's players
- To provide the learner with information about factors putting impact on aviation industry.

Block Structure :

Unit 1 : Transportation System in Tourism Industry

Unit 2 : Origin & History of Air Transportation

Unit 3 : Organisation & Trade Association of Air Transportation Industry

Unit 4 : Issues, Challenges & Trends in Air Transportation

UNIT 01

Transportation System in Tourism Industry

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- To provide the learner with informationabout transport and its various means.
- To make learner understand aboutlinkages between transport and tourism.

1.1 INTRODUCTION :

It is undoubtedly hard to say that after the travel has begun we have created numerous techniques to provide comfort for ourselves. As civilisation progressed inventors began to invent new items and in these inventions we have developed multiple modes of transportation. Whether the word "Transport" comes from an Old French transporter, which means "to carry or convey across," or from Latin transport, we now know what it implies. We may have vaguely remember the history of road transport

and its various stages of growth. But we use it frequently for our convenience, and we are always building more convenient and rapid modes of transportation.

Since ancient times, the transportation system had a significant influence on the evolution of travel. Well–engineered road systems, organised road transport centred on horse and cart teams, organised maritime travel in the Mediterranean, and a hospitality sector all helped these early travellers get from point "A" to point "B". The creation of the steam train, followed by the car and then the jet, has increased humanity's ability to travel to even the most remote corners of the earth.

The Romans' invention of roads to the development of wide–bodied passenger aircraft, each new achievement in transportation technology has permitted the travellers to go further, faster, for less money, and in greater luxury and safety. The transportation infrastructure has provided the groundwork for the growth of both domestic and international tourism in its current form, beginning with rail in the 19th century and private automobiles and commercial air services in the 20th century. Travel from origin market was convenient, reasonably rapid, and inexpensive due to advent of trains. Trains were substantially responsible for the creation of coastal resorts in many developed countries in the nineteenth century.

Similarly, the private vehicle and public bus industries opened up continental landmasses such as Europe and North America to mass tourism in the twentieth century. Aviation advancements such as the jet engine and wide–body passenger planes opened up the possibility of mass transcontinental travel. In many places of the world, air travel has contributed significantly to the rise of tourism.

The improvement of transportation infrastructure is a prerequisite for the growth of the tourism industry. It is extremely significant in the tourism industry. It connects many places and people and provides basic accessibility. Water travel, road transport, rail transport, and air transport are the four major means of transportation. Each means has its own importance.

1.2 CONCEPT OF TRANSPORT :

Tourists spend approximately 30% to 40% of their vacation expenditure on transportation, with the remainder going toward food, hotel, and other activities. Once again, this feature emphasises the need of transportation.

Transportation refers to the movement of people and/or goods from one location to another, as well as the many methods used to accomplish this. The ability and the needto carry large quantities of commodities or groups of people across great distances in comfort and safety has grown as civilization and, in especially, technical progress has progressed.

The phrase "transportation system" refers to the technology and logistics of conveying persons and products at its most basic level. It

includes all modes of transportation, from cars and buses to boats, planes, and even space travel. Transportation systems were developed and used in troop logistics and planning in the beginning, later in the operation of the locals and for the movement of tourists.

Transportation systems come in a range of shapes and sizes. Local transportation networks that cover a city's bus/metro rail network and its suburbs, as well as country–wide delivery networks covered trough bus, trains and air services.

Airlines coordinate their flights via international transportation systems. When using a transportation system, the longer the distance to be travelled, the much more efficient way of commuting.

1.3 TYPES OF TRANSPORT :

A visitor can travel by a number of transportation modes. Both the tourist and the tourism expert should be aware of the numerous forms of transportation available to get to and from the destination.

The numerous modes of transportation can be grouped into three categories: water transportation, surface transportation, and air transportation. Surface transportation is further divided into rail and road modes.

1.3.1 Water Transport :

Since the beginning of time, humans have used water to transport goods and people from one location to another. Around 6000 BC, the boats evolved from a simple raft with some alterations and improvements.

Until the middle of the twentieth century, the only way to travel internationally was by ship. The Cunard Steamship Company began operating regular steamship services on the North Atlantic in 1838. During World War I, the steamship company's operations were forced to be halted in 1914. Following World War I, steamer luxury liners resumed service until World War II. After WWII, huge luxury liners resumed their operations around the world, transporting passengers and vacationers. Swimming pools, cinema halls, stores, a casino, and other amenities were available on some of the ships, which could accommodate up to 1000 passengers.

The cruise lines have become a new tourist draw. Cruises to the tropical and subtropical waters of Hawaii, the Caribbean, the Mediterranean, and other destinations are scheduled months in advance. Ferrying and cruising are the two main modes of water transportation used in travel and tourism today. Wave–piercing, hydrofoil, and hovercraft are examples of modern over the water vessels that are utilised for short distance trips. Riverboat travel also uses water mobility. Since the first immigrants arrived in the United States, the Mississippi River has been a famous tourist destination. Today, travellers can take two or three–day Luxury River cruises. The Rhine, which winds through Germany's wine–growing regions, offers similar leisure tourist trips across Europe. Over rivers,

motorised ferries and launches convey visitors and locals, transport vehicles, and provide amenities such as parking, restaurants, and viewing decks.

The advantages of water transportation include cost savings, increased carrying capacity, and the development of international and coastal trades.

1.3.2 Road Transport :

In the prehistoric age, humans travelled from place to place in quest of sustenance. Carrying the load and travelling, they domesticated animals such as the cow, horse, camel, reindeer, elephants, and others. Humans invented the cart, the chariot, and the carriage after discovering the wheel.

Horses were utilised for travel until the seventeenth century. Better roads were built later, and some of these roads became trade routes that connected several countries. The Silk Route, which was used to transport Silk from China to Persia, and the Blue Gem Road, which extended from Iran to Afghanistan and India, are two among them.

The bus or car is today's most popular and commonly used means of road travel. The vehicle, which affords visits to the landscape and the freedom to move are dominated by road transports. Tourists frequently travel with their family on vacation. Coaches and tourist automobiles are obligatory vehicles to promote tourism for these tourists. Large tourist groups going on a set tour itinerary, tourist coaches or buses are chosen frequently. Many tourists prefer to hire vehicles to travel in luxury and privacy. Rental cars are available in a variety of manufacturers and models.

While on vacation, tourists also travel by car. The car rental sector of the tourism industry in foreign countries is well developed. The client can either hire a car directly or through an agent. The client can drive the car themselves after arriving at the destination. The only prerequisite is International Driving Licence.

1.3.3 Rail Transport :

The railway is the most economical, convenient, and popular mode of travel especially for long distance travel all over the world. The railroad was invented in the seventeenth century in Germany with wooden tracks. The first steel rail was developed in the USA during the early 1800s. The railways revolutionized transportation and mass movement of people seen in the nineteenth and twentieth centuries.

The broad gauge lines account for more than 55 percent of the total network and carry 85 percent of total traffic. The steam engines have been replaced by diesel and electric engines which have helped in increasing the speed. Railways have promoted tourism by introducing a special tourist train.

Indian Railways has a long history, dating back over 170 years. The first passenger train operated between Boribunder (Bombay) and Thane, a distance of 34 kilometres, on April 16, 1853 (formal inauguration ceremony with 400 guest). It had thirteen carriages and was pulled by

three locomotives named Sahib, Sultan, and Sindh. After inauguration, On August 15, 1854, the first passenger train departed Howrah station for Hooghly, a distance of 39 KM. The East Indian Railway's first segment was thus opened to public traffic, marking the start of railway travel on the subcontinent's eastern side. The Madras Railway Company opened the first line in the south on July 1, 1856. It lasted for 63 kilometres between Vyasarpadi Jeeva Nilayam (Veyasarpandy) and Walajah Road (Arcot). On March 3, 1859, a 119–mile line was laid from Allahabad to Kanpur in the North. On October 19, 1875, the first section from Hathras Road to Mathura Cantonment was opened to traffic.

In Europe, the railway systems of six European countries have been clubbed to make rail travel easier for the people of Europe. A rail passenger can buy a ticket in any one country of Europe and travel through six countries. For the foreign tourists, Eurail Passes offer unlimited discounts travel in express trains for periods ranging from a week to three months. In the USA, AMTRAK operates trains.

1.3.4 Air Transport :

Long–distance travel has gotten considerably easier and more economical in recent years as air travel has grown in popularity. Instead of kilometres, distance is now measured in hours. The world has shrunk to the size of a little village. After World Wars I and II, air transportation began to flourish. Commercial airlines were designed with travellers in mind. The business sector is quickly expanding as a result of increased air traffic. Swiss Air was already transporting roughly 14–16 passengers between Zurich and London before WWII.

KLM, the Dutch Airlines, launched the first commercial service between Amsterdam and London in 1920. After World War II, commercial air travel took off. More amenities were added, and travel became more comfortable. Great Britain was the first country to introduce jet flights in 1952. Pan American Airlines began flying the Boeing 707 between Paris and New York in 1958. The introduction of jet planes resulted in a massive surge in air traffic from 1959 onward. During this year, the notion of chartered flights was also introduced. Travel has been transformed by jumbo planes. Air travel is popular because of its speed, comfort, and cost–effectiveness in terms of time savings.

As a result, the modern age is the era of mass air travel. Air travel is the most popular means of transportation after road travel, especially for international travel. Air travel is more convenient for business travellers because it saves them time and provides a luxury and hassle–free experience. Many airlines now provide unique services for business travellers, such as Internet access on board.

1.4 CHARACTERISTICS OF TOURIST TRANSPORTATION :

A well–functioning transportation system is critical to a country's economic growth and development. People have less time due to the fast

pace of life, and they want to see more and more destinations in a shorter amount of time.

The tourism sector is being turned into a new viewpoint with the advent of new efficient modes of transportation such as aircraft, rapid trains such as the Shatabdi, Rajdhani, Duranto and Vande Bharat Express as well as good roads such as the Expressway from Delhi to Agra and many more under construction will be advantageous in future. In terms of travel and tourism, each method of transportation has its unique peculiarities.

1.4.1 Water Transportation :

Until the middle of the twentieth century, shipping was the primary mode of international travel. The raft, which was composed of grasses, wood, and other light materials, was the first sort of boat. The quality of boats and ships has greatly increased in recent years, and water transportation has been used to make the majority of world discoveries. This is clear since cruise tourism is growing rapidly and has enormous potential.Lakes, rivers, canals, and the Backwaters Sea are all popular water–based tourism destinations around the world. Some of their characteristics include:

- Sea transport is less expensive but slower.
- Land that is separated by water is connected by sea transportation.
- Water transportation is ideal for bulk goods and low–cost items like coal, oil, and timber.
- It is determined by terrain, rivers, and the network of channels.
- Water travel has longer distances, longer transit times, and slower conveyance.
- Water transportation is affected by seasonal and climate factors such as fog, water level, and ice.
- Perishable and time–sensitive items suffer.
- There are very few incidents in water transportation.
- When compared to other modes of transportation, it is generally less expensive.
- The fixed costs are large, but the variable costs are minimal.

1.4.2 Road Transportation :

Road transportation connects many areas and people and provides basic accessibility. It also has a lot of benefits, such as increased flexibility, increased reliability, increased speed, and lower costs. It is more efficient than other modes of transportation and is accessible to a vast number of people. It can transport tourists to their final destination. National and state highways are equally critical in the construction of a well–connected network of roads. Both flyovers and decent road conditions have aided in the growth of transport and tourism around the world. Cars, taxis, coaches, buses, and jeeps are among the several forms of road vehicles

that can connect rail, air, and marine transportation.Characteristics of this mode can be summarised as :

- The ability to shift a vehicle from one lane to another is provided by road transit.
- Different types of vehicles use the roads.
- It facilitates the transportation of workers, machinery, and supplies.
- Goods are transported by road transit, which benefits the agriculture sector.
- Constructionand maintenance are less expensive as compare to other means
- It provides door–to–door connectivity, even in rural areas or villages.
- Can be used as intermodal transportation as it provide ease to access to railways, rivers, and flight.

1.4.3 Rail Transportation :

For long distance travel, the railway is the most convenient and cost–effective mode of transportation. For longer journeys, it is much cheaper and more pleasant than road transportation. For business, education, sightseeing, pilgrimage, and visiting friends and family, a large group of individuals can travel together from one part of the country to another. General, Sleeper, AC Classes, AC Chair Car, and other types of coaches are available. The railway provides the necessary infrastructure for tourists to go to practically every corner of the country. The introduction of high–speed trains with numerous amenities such as refreshment, berth, food, internet, and washrooms is a fascinating development in current times. It has boosted the travel and tourist industry significantly.Rail transportation has the following characteristics:

- It can move large and bulky cargo.
- Land acquisition, track laying, railway station and shed construction, and automobile acquisition all necessitate large investments.
- It necessitates government protection and investment.
- The same tariffs apply to everyone and are available in all parts of the country.

1.4.4 Air Transportation :

Air travel is the second most prevalent means of transportation worldwide, after road travel. It is the quickest mode of transportation. One can travel thousands of kilometres in hours to reach their objective. Air travel has connected every country on the planet. The entire planet has been converted into a Global Village. Surface obstacles such as impassable mountains, dense forest, marshy plains, flooded places, and scorching and cold desert are not an issue with this mode of transportation. Air travel has key properties such as high speed, which saves time and provides a luxury journey. It is a convenient, luxurious, and pleasant mode of transportation.Characteristics of this fastest mode of transportation are:

- It offers a consistent, convenient, efficient, and timely service.
- Fruits, vegetables, eggs, meat, and other perishable commodities can be delivered fast.
- Construction and maintenance of track is not as expensive as it is for railways.
- They provide passengers with excellent services and ensure the safety of their cargo.
- It can be used to convey commodities to places where other modes of transportation are unavailable.
- It is extremely beneficial in the event of a flood or landslide, and war rises to the occasion to save human life.
- It is an extremely expensive means of transportation. The rates and fares offered by are out of reach for the average person.
- Aircraft are not designed to transport big loads and weights.
- It is unreliable due to inclement weather, which can disrupt flight service at any time.
- Aerodrome construction and maintenance need a significant financial investment.

1.5 ROLE OF TRANSPORT IN TOURISM :

Increases as a result on transportation to connect the tourist–generating and destination areas. The rate of visitor flow is determined by the capacity of a transportation system. Aside from increasing the capacity of the transportation system, providing comfort, reasonable high speeds while maintaining safety, ticket savings, and light refreshments are also incentives. It boosts the tourism industry in these locations. Tourists' memories of good or terrible transportation service encounters might linger for the rest of their lives. As a result, it is apparent that a tourist transportation infrastructure is critical for tourism growth and development.

In many places of the world, tourism has underperformed in comparison to the country's natural resources. Poor transportation networks are one of the things cited as being underperforming. Maintenance of existing roads, construction of new roads/rail tracks/sea and air transportation, construction of local airports, and augmentation of local flight operations are all transportation needs for tourism promotion and development. It was shown that transit security and safety are not awful, even though tourists believe transportation prices to be expensive. If more could be done in various aspects of transportation networks, tourism development may be much greater.

The type of transportation used and how frequently it is used determine whether or not transportation improves a tourist's trip experience. Cruises, Orient Express trains, river boat cruises, and other tourist attractions can all be made into discrete carrier elements.

❑ **Check Your Progress :**

1. The formal inauguration of Rail in India took place in _____
   a. March 3, 1859 b. July 1, 1856
   c. April 16, 1853, d. August 15, 1854
2. _____ Mode of transportation is considered as the most economical mode.
   a. Water b. Rail c. Road d. Air
3. _____ mode is most easy to access mode of transportation.
   a. Water b. Rail c. Road d. Air
4. The Blue Gem Road was extended from:
   a. Iran to Afghanistan and India
   b. China to Persia
   c. Rome to Australia
   d. India to Egypt
5. The _____ road was used to transport silk from China to Persia.
   a. Porcelain Road b. Blue Gem Road
   c. Silk Road d. Persian Royal Road
6. _____ was the first country to introduce jet flights.
   a. Germany b. Netherlands c. USA d. Great Britain
7. _____ the Dutch Airlines launched the first commercial service between Amsterdam and London in 1920.
   a. Qantas b. KLM
   c. British Airways d. Lufthansa
8. The Cunard Steamship Company began operating regular steamship services on the North Atlantic in the year of _____.
   a. 1914 b. 1938 c. 1838 d. 1853

1.6 LET US SUM UP :

Transportation development is critical for tourism growth and development. It makes it possible for tourists to get there. Tourism is hampered in the area with the least accessibility. Water travel, road transport, rail transport, and air transport are the four modes of transportation. Providing adequate connectivity to various tourist attractions attracts visitors.Tourists come from a variety of socioeconomic backgrounds. As a result, diverse options for reaching tourist locations should be available to each.

Rivers have been utilised to carry people, commodities, and cattle since the Indus Valley civilization. With the advancement of technology, transportation is no longer just a means of transporting goods or people, but also tourism attractions such as the Toy Train, Palace on Wheels, Fairy Queen, Heritage on Wheels, cruises, and so on.

1.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. c	**2.** a	**3.** c	**4.** a
5. c	**6.** d	**7.** b	**8.** c

1.9 GLOSSARY :

Back Water : A portion of a river with little or no current that runs alongside it before re–joining it, or a body of water in a main river that is backed up by the sea tide or a dam.

Broad Gauge : A railway track with a wider distance between the lines than the 1.44 metre standard gauge.

Cold Deserts : It has ice and snow on the ground and are found in Antarctica, Greenland, Northern and Western China, Turkestan, Iran, and the Nearctic region of the Earth.

Expressway : A high–speed road with limited access and various amenities such as access ramps and lane dividers.

Prehistoric Age : Encompasses the millions of years before humans began to record their lives and the world in which they lived in writing.

River Cruises : With the tiny size and flexibility of the vessels, a type of leisure travel that carries tourists down inland waterways offers the opportunity to see lesser–known locations around the world.

1.9 ASSIGNMENT :

What steps are taken care by your local/state government to provide more connectivity to different tourism attractions and intermediately area so that development can be fuelled in your state ?

1.10 ACTIVITIES :

Go through websites of Ministry of Tourism (GOI) and state and find out what initiatives taken by them for tourism development in your state.

1.11 CASE STUDY :

Tourists can now recharge metro smart cards through Delhi Tourism App

By Press Trust of India, Delhi

The Delhi Tourism and Transportation Development Corporation (DTTDC) officials said that tourists can now recharge their Metro smart cards using the Delhi Tourism App. The application also contains fares and other route details useful for foreign tourists.

"We strive to give tourists from all over the world the best experience in Delhi. So, with the help of Delhi Tourism App's metro recharge feature, now tourists can plan their complete journey with one app. This feature enables users to enhance their tourism experience by providing them

hassle free facility of recharging their metro cards through the app while exploring Delhi's tourist hotspots," a senior DTTDC official told PTI, requesting anonymity.

To avail the facility, the user will have to visit the 'Travel within Delhi' section of the app and then select 'Metro' and then click on the recharge tab. The app will then redirect the user to the Delhi Metro Rail Corporation website for smart card recharge.

App useful for foreign tourists

Officials said that the new feature is very useful as many foreign tourists who come to visit Delhi or even Indian tourists from other cities are not aware of Delhi's public transport system and its ticketing and recharge facility.

"So if they download the Delhi Tourism App they will not have to stand in a queue or go through the hassle of searching other online recharge options," the official added.Delhi Tourism Department's mobile application was launched by Chief Minister ArvindKejriwal on World Tourism Day on September 27 last year. 'DekhoMeriDilli' is the tagline of the app.

Attempt to make travel a bliss

The app provides many user–friendly features to make tourism and travel experience in Delhi a bliss as it provides all the information ranging from tourist hotspots, popular local cuisines and market places to heritage walks through single click, the officials said.

They said the app is unique in nature as small audio and video files of a particular tourist destination have also been embedded to give the traveller a sneak peek into the tourist spot.

It allows tourists to see key highlights of any monument or other tourist location without even going there.

Questions :

1. Why the government is giving special attention to foreigners.
2. What impact can be seen on the daily life of local ?
3. Will this step attract the tourist ?

1.13 FURTHER READINGS :

1. Introduction to Tourism Transport by Louisa Klemmer and Sven Gross
2. Tourism, Public Transport and Sustainable Mobility by Prof. C. Michael Hall, Diem–Trinh Le–Klähn, Yael Ram
3. Tourism and Transport by David Timothy Duval
4. Fundamentals of Air Transport Management by P S Senguttavan

UNIT 02

Origin & History of Air Transportation

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES :

- To provide the learner with informationabout origin and growth of Airline industry.
- To make learner understand aboutthe effect of World War.
- To make aware about role of Airlines in promoting tourism.

2.1 INTRODUCTION :

Air travel is by far the most efficient means of transportation. Just because of the high cost of flying, only 12.5 percent of tourists fly, however this figure rises to roughly 40% for international travel in recent days. Air travel has transformed the geographical aspect of distances; even the most isolated regions can now be accessed, and any voyage across the world may now be estimated in hours. Business travellers are the most frequent users of airline services, although low–cost airlines have attracted a sizable market sector that is mostly used for tourism.

By 1917, US Congress appropriated $100,000 for an experimental airmail service to be conducted jointly by the Army and the Post Office between Washington and New York, with an intermediate stop in Philadelphia. The first flight left Belmont Park, Long Island for Philadelphia on May 14, 1918 and the next day continued on to Washington, where it was met by President Woodrow Wilson.

On May 20, 1927, a young pilot named Charles Lindbergh set out on an historic flight across the Atlantic Ocean, from New York to Paris. It was the first trans–Atlantic non–stop flight in an airplane, and its effect on both Lindbergh and aviation was enormous. Lindbergh became an instant American hero. Aviation became a more established industry, attracting millions of private investment dollars almost overnight, as well as the support of millions of Americans. In 1928, when Amelia Earhart accompanied pilot Wilmer Stultzand became the first female passenger to cross the Atlantic by airplane started inspiring other female students to join the industry. Later on many female aviators had been found in the industry.

Henry Ford, the automobile manufacturejumped into aircraft manufacturing, and in 1927, produced the Ford Trimotor, commonly referred to as the Tin Goose. It was one of the first all–metal planes, made of a new material, duralumin, which was almost as light as aluminium but twice as strong. It also was the first plane designed primarily to carry passengers rather than mail. The Ford Trimotor had 12 passenger seats; a cabin high enough for a passenger to walk down the aisle without stooping; and room for a "stewardess," or flight attendant, the first of whom were nurses, hired by United in 1930 to serve meals and assist airsick passengers.

Boeing built what generally is considered the first modern passenger airliner, the Boeing 247. It was unveiled in 1933, and United Air Lines promptly bought 60 of them. Based on a low–wing, twin–engine bomber with retractable landing gear built for the military, the 247 accommodated 10 passengers and cruised at 155 miles per hour. Its cabin was insulated, to reduce engine noise levels inside the plane, and it featured such amenities as upholstered seats and a hot water heater to make flying more comfortable to passengers. Eventually, Boeing also gave the 247 variable–pitch propellers that reduced takeoff distances, increased the rate of climb, and boosted cruising speeds.

In 1938 the U.S. government, through the Civil Aeronautics Board (CAB), regulated many areas of commercial aviation such as routes, fares and schedules. The CAB had three main functions: to assign routes to airlines, to limit the entry of air carriers into new markets, and to regulate fares for passengers.

As jets were integrated into the market in the late 1950s and early 1960s, the industry experienced dramatic growth. By the mid–1960s, airlines were carrying roughly 100 million passengers and by the mid–1970s, over 200 million Americans had travelled by air. This steady increase in air travel began placing serious strains on the ability of federal regulators to cope with the increasingly complex nature of air travel.The onset of high inflation, low economic growth, falling productivity, rising labour costs and higher fuel costs proved problematic to the airlines.It is generally recognized that the purpose behind government regulation is to create a stable industry.

In 1978, the airline industry, which had been heavily regulated and controlled, was liberated from government oversight and released to the vagaries of the marketplace. As a result, the industry underwent significant change during the 1980s and 1990s. At the same time, several major air disasters took place, including the 1996 Valujet and TWA 800 aircraft crashes. In response to the post–accident events, Congress passed the Aviation Disaster Family Assistance Act (ADFAA) the same year. The terrorist attacks of September 11, 2001, wrought further change on the airline industry. Just weeks after the attacks, President George W. Bush signed the Air Transportation Safety and System Stabilization Act (ATSSSA). According to a statement released by President Bush on September 22, 2001, the Act was intended to ensure passenger safety and to "assure the safety and immediate stability of the nation's commercial airline system." It also created financial turmoil for nearly all the major carriers. What followed was a period of evolution and metamorphosis that changed the nature of flying forever.

The United States Airline Deregulation Act of 1978 was a dramatic event in the history of economic policy. It was the first thorough dismantling of a comprehensive system of government control since the Supreme Court declared the National Recovery Act (1933) unconstitutional. It also was part of a broader movement that, with varying degrees of thoroughness, transformed such industries as trucking, railroads, buses, cable television, stock exchange brokerage, oil and gas, telecommunications, financial markets, and even local electric and gas utilities.

2.2 THE AIRLINE INDUSTRY–ORIGIN AND GROWTH :

Air travel was slow to take off after the Wright Brothers' breakthrough at Kitty Hawk on December 17, 1903. The first futile attempts to start regular passenger services took more than a decade. Ex. Mayor of St. Petersburg Abram C. Pheil became the world's first paying passenger with planned journey across the bay between Tampa and St. Petersburg, Florida, on January 1, 1914 piloted by Tony Jannus. Thomas Benoist, an auto parts manufacturer, built this flying boat. The single–plane service carried only one passenger at a time and charged a $5 one–way fee. With the end of the winter tourist season, the company dissolved after operating two flights a day for four months.

Early flights made headlines, but commercial aviation took a long time to gain traction with the general public, who were mostly scared to ride in the new planes. Aircraft design advancements were also slow. With the outbreak of World War I, however, the military usefulness of planes was soon realised, and manufacturing soared to meet the increasing demand for planes from governments on both sides of the Atlantic. The development of more powerful motors was the most significant, allowing aircraft to attain speeds of up to 130 miles per hour, more than double that of pre–war aircraft. Larger aeroplanes were also conceivable due to increased power.

Despite the fact that commercial aviation did not take off perfectly the first time, an increasing number of companies attempted to profit from this milestone during the 1920s, with varying degrees of success. Air travel has become a common and practically indispensable part of people's lives in both developed and developing countries. Despite changes in many aspects of air travel, airfares have benefited both customers and service providers. KLM (the world's oldest continuously operating airline), the Dutch Airlines, launched the first commercial service between Amsterdam and London in 1920. Commercial air travel expanded primarily after World War II. More facilities were added, and travel became more comfortable.

On August 25, 1919, a British group called Air Transport and Travel, Ltd. made its inaugural flight from London to Paris with a single passenger, an enterprising newspaper reporter. Other competitors entered the market to compete with better improved technology. Imperial Airways operated in Africa and the Middle East during the 1920s. By 1924, independent airlines in the United Kingdom had consolidated into one entity, Imperial Airways Ltd., with government support, in order to compete with heavily subsidised French airlines in Europe.

It was difficult for France to remain behind because it had territorial possessions in Africa as well as significant business interests in Latin America. As a result, French airlines flew along Spain's Mediterranean coast, over to Morocco, and down Africa's western coast as far as Dakar, Senegal. By the 1930s, the French had also established operations in South America and were experimenting with mail delivery across the South Atlantic.

Germany was unable to develop military aircraft due to the Treaty of Versailles so they focused its efforts on civilian designs. The government approved of the expansionist plans of Deutsche LuftHansa (now Deutsche Lufthansa AG), which was founded in 1926.

Imperial Russia emerged from the ruins of World War I as the Union of Soviet Socialist Republics. The communist regime quickly adopted aviation as a symbol of a new technological world to be shaped by the industrial proletariat. Aeroflot, the state airline, not only served propaganda purposes, but also became an indispensable medium for rapid transportation and a visible means of connecting the Soviet Union's sprawling, divergent regions.

Tourism was primarily for the elite, and independent travel was the norm. However, the emergence of mass tourism and the significant revenue it generates for local economies necessitated the establishment of mass transportation systems as well as specialised firms such as travel agencies that organise travel on behalf of their customers. These companies were able to use their pricing power to negotiate large volumes of passengers for carriers and hotels. Some even became airlines, such as Thomas Cook Airlines and Air Transat, which are major charterers in

their respective markets. Contrary to popular belief, the rise of online travel booking services has aided the resurgence of independent modes of transportation by allowing individuals to book complex travel services such as transportation and hotel accommodations.

2.3 ADVENT OF THE JET :

The gas turbine, or jet, engine was invented in 1929 by a British engineer named Frank Whittle. The first jet–powered aircraft took to the skies in 1939. Several jet–powered fighters and bombers were developed before the end of World War II, but they arrived too late to make a significant difference. The first generation of jet–powered aircraft were built on existing airframes that had not been designed for turbojet propulsion. The late 1940s saw the birth of the second generation of jet aircraft, which featured aerodynamic improvements like swept–back wings and thinner control surfaces. Some of these jets may be faster than the speed of sound. A third generation of jet–powered aircraft capable of supersonic flight began to enter service in the mid–1950s.

The 1950s also saw the introduction of passenger jet service, with Pan American World Airways launching the Boeing 707 in October 1958. The introduction of jet flights resulted in a massive increase in air traffic beginning in 1959. This year also saw the introduction of the concept of chartered flights. Fighter planes could reach top speeds of more than Mach 2, or twice the speed of sound, by the mid–1960s. In 1967, the first V/STOL (vertical/short take–off and landing) fighter jet went into service. Travel became faster and more accessible as technology advanced, allowing people to travel around the world. Jumbo jets have transformed air travel. Due to the speed, comfort, and economy of flying, a large number of people travel by air.

2.4 EFFECTS OF WORLDWAR ON AIR–TRANSPORT SYSTEM :

In several ways, the war was terrible for commercial aviation. It concentrated all of its design and manufacturing efforts on military aircraft. Flying became associated with bombing flights, spying, and aerial dogfights in the public's mind. Furthermore, towards the end of the war, there was such a big glut of planes that demand for new manufacturing was essentially non–existent for several years, and many aircraft manufacturers went bankrupt. Some European countries, such as the United Kingdom and France, helped to foster commercial aviation by launching flights across the English Channel. Nothing like this happened in the United States, where there were no natural barriers isolating big towns and trains could carry passengers almost as quickly as an aeroplane and in far greater comfort. Following World War I, a government programme saved the commercial aviation business in the United States, but it had nothing to do with people transportation.

Lighter–than–air aircraft hot air balloons, zeppelins, and other airships were widely deployed for observation, reconnaissance, artillery spotting,

antisubmarine patrol, and even combat operations at the start of World War I. Only reconnaissance was carried out with the underpowered and unarmed heavier–than–air planes.

The need of airspace control was quickly realised, leading to the development of fighter planes with more powerful engines and superior designs.Fighter pilots and observers carried pistols or rifles on board to fire down enemy planes at the start of the war, but by 1915, both the Germans and the Allies were using fighter planes armed with machine guns. Throughout the conflict, new generations of combat aircraft entered service, including fighters, reconnaissance flying boats, and the first ship–based aircraft.

Aviation had a huge influence on the outcome of World War II, and the war had an equal impact on aviation. When Hitler marched into Poland in 1939, the United States had just about 300 air transport planes. American aircraft manufacturers were manufacturing 50,000 planes per year by the end of the war.

The majority of the planes were fighters and bombers and the value of air shipments to the war effort was immediately recognised. Throughout the war, aeroplanes provided critical airlift to keep troops and supplies moving to the front lines and back to the manufacturing plants. For the first time in their history, the airlines had significantly more business than they could handle, both in terms of passengers and freight. Many of them also had the chance to pioneer new routes, acquiring experience that would give them a far broader perspective after the war.

While the United States made several advancements in aircraft design during the war, allowing planes to fly faster, higher, and further than ever before, mass manufacturing was the primary goal. Europe was home to the greatest innovations of the wartime period, including radar and jet engines.

While the standard combat aircraft of World War I was an open–cockpit, fabric–covered biplane with fixed landing gear and top speeds of just over 100 mph, World War II began with all–metal, enclosed–cockpit monoplanes with retractable landing gear and top speeds of more than 350 mph. Standard equipment included oxygen, voice radios, parachutes, gyroscopic flying instruments, and electric cockpit illumination.

Fighters, bombers, reconnaissance, and carrier aircraft all saw significant technological advancements during WW II. It was also the dawn of the helicopter and the coming of age of air transportation.

Since the development of radar during WW II, aircraft designers have been looking for techniques to lower aircraft radar signatures. New materials, including as carbon–fibre composites and high–strength polymers, had been created by the 1970s that were both light and robust enough for flying. These materials absorb rather than deflect radar energy, making them more difficult to detect. To evade radar detection, an aircraft's design must be altered to avoid straight angles, abrupt curves, and big surfaces.

Northrop introduced the N–1M flying wing in 1940. This was the first aeroplane to use a single airfoil construction that housed the pilot, engine, and fuselage. The B–2 stealth bomber was inspired by its revolutionary design. The first stealth fighter, the F–16, went into service in 1983, and the first stealth bomber, the B–2, went into service in 1989.

After World Wars I and II, air transportation began to flourish. Commercial airlines were designed with travellers in mind. The business sector is quickly expanding as a result of increased air traffic. Swissair was already transporting roughly 14–16 passengers between Zurich and London before WWII.

2.4.1 After World War :

Fewer than 6,000 people per year flew when the first commercial airlines began operating following World War I. Eastern Air Lines, United Air Lines, American Airlines, and Trans World Airlines (TWA) dominated commercial air transportation by the 1930s. The federal government had granted these businesses exclusive rights to fly local airmail routes, while Pan American (Pan Am) had the rights to fly international routes. Until deregulation in 1978, these four airlines' grip on lucrative contracts was practically unquestioned. The Big Four and Pan Am were given permanent rights to these routes even after the Civil Aeronautics Board (CAB) was established in 1938 to licence new airlines, provide new routes, authorise mergers, and investigate accidents. No new major scheduled airline was licensed for the next four decades.

2.4.2 Effect of Cold War :

During the Cold War, the U–2 high–altitude aircraft was built to conduct reconnaissance from above the range of Soviet anti–aircraft fire. It had a range of 3,000 miles and could transport up to 700 pounds of photoreconnaissance equipment to an altitude of 70,000 feet, which was previously unheard of. The U–2 entered service in 1956, with a two–year operating life predicted at the time. The U–2, on the other hand, served in every post–Cold War American combat and is still in use today.

2.5 ROLE OF AIRLINES IN TOURISM PROMOTION :

At the international level, air travel is the dominant mode of transportation. It transports passengers to various overseas destinations before returning them to their own countries. This provides opportunity to the people to travel new destination, exchange ideas, and improve tourism. Airlines and airports have played a significant influence in the development of new destinations. Without aircraft, many continents, countries, regions, and islands would have remained inaccessible to the majority of us, and even well–known places would have attracted significantly fewer visitors – or none at all.

International airlines' function in the tourism industry is to provide mass and speedy transit between countries in a safe, standardised, and cost–effective manner. Its relationship to the tourism sector can be better

understood by dissecting tourism into its constituent pieces. People are encouraged to travel for many reasons as destinations have become more accessible as a result of rapid and effective transportation. These are some of the reasons to travel. Sightseeing includes historical, cultural, social, and technical attractions. Beach and mountain resorts for relaxation Mountain climbing, skiing, surfing, and scuba diving are examples of sports. Art, history, religion, culture, and science study tours are available. The travel sector necessitates a well–functioning infrastructure, which when combined becomes the world's second–largest industry called tourism. The infrastructure is as follows: Each country's national carrier is a source of prestige. Lufthansa of West Germany, British Airways of the United Kingdom, and Air France of France are just a few examples. Governments negotiate with each other to give certain "freedoms" so that these carriers can fly to or over other countries to achieve their destinations.

The aeroplane had a significant impact on tourism after World War II. The era of mass air travel is currently underway.The development of air travel has been one of the most important social trends of the post war age. Airlines are giving reduced promotional prices to entice more passengers. Promotional fares include excursion and group fares, for example. This promotions encourage the people to explore the globe, out of curiosity.

The economic conditions in the primary generating source markets closely reflect international tourism demand. Tourism could not escape the effects of the global financial crisis. Apart from dampening total tourism demand, the crisis influenced tourism flows, with fewer long–haul flights from major European source markets and an international trend for more vacations closer to home. The relative prices of various currencies are still fluctuating, affecting destination relative competitiveness.

❑ **Check Your Progress :**

1. Who was the first female passenger to cross the AtlanticOcean ?
   a. Helen Richey b. Harriet Quimby
   c. SarlaThukral d. Amelia Earhart
2. Who was the President of America during 9/11 ?
   a. Woodrow Wilson b. George H. W. Bush
   c. George Walker bush d. Bill Clinton
3. Who was became the world's first paying passenger with planned journey ?
   a. Harriet Quimby b. Abram C. Pheil
   c. Wilmer Stultz d. Thomas Benoist
4. Which of the following is the world's oldest continuously operating airline ?
   a. Imperial Airways b. Aeroflot
   c. Lufthansa d. KLM

5. Who inventedjet engine in 1929 ?

a. Wright Brothers b. Frank Whittle

c. Thomas Benoist d. Blanche Scott

6. Which of the following was the first aeroplane to use a single airfoil construction that housed the pilot, engine, and fuselage.

a. B–2 b. F–16 c. N–1M d. U–2

7. Which of the following is the flag carrier of Germany ?

a. KLM b. Lufthansa c. Qantas d. Etihad Airways

8. In which year the Air Transportation Safety and System Stabilization Act (ATSSSA) was passed ?

a. 1901 b. 1911 c. 2001 d. 2011

2.6 LET US SUM UP :

After the Wright Brothers' breakthrough at Kitty Hawk on December 17, 1903, air travel took a long time to take off. It took more than a decade for the first failed attempts to start regular passenger services. The first paying passenger with a prearranged route flew on January 1, 1914. This flying boat was developed by Thomas Benoist, an auto parts manufacturer. After four months of operating two flights each day, the company disbanded at the end of the winter tourist season. Earhart became the first female passenger to fly across the Atlantic with pilot Wilmer Stultz in 1928. However, with the onset of World War I, the military utility of planes was quickly recognised, and production rose to fulfil the growing demand for planes from governments on both sides of the Atlantic.

Flying was novel and risky in the early twentieth century. Traveling by plane was uncommon. There were no airlines, airliners, airports, or air routes.The first commercial service between Amsterdam and London was inaugurated by KLM in 1920, making it the world's oldest continually operational airline. Other European countries found it impossible to stay behind because they all have territorial possessions in different parts of the globe. Due to the Treaty of Versailles, Germany was unable to create military aircraft, therefore it concentrated on civilian designs. Before the conclusion of WWII, several jet–powered fighters and bombers were built. Commercial aviation suffered greatly as a result of the war in various ways.

2.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. d	**2.** c	**3.** b	**4.** d
5. b	**6.** c	**7.** b	**8.** c

2.8 GLOSSARY :

Airspace : The space above the earth or a specific area of land or water, particularly space above a nation and falling under its jurisdiction.

Cockpit : Also called flight deck, is the area in which a pilot controls an aircraft or spacecraft. It is usually located near the front of the aircraft.

Commercial Aviation : The use of planes for carrying goods or people, rather than for military purposes.

Congress : Also known as members of the House is the legislature of the federal government of the United States.

Deregulation : The Airlines Deregulation Act of 1978, which removed government regulation of airline routes and pricing, is known as the term.

Fighter Pilot : A military aviator trained to engage in air–to–air combat, air–to–ground combat and sometimes electronic warfare while in the cockpit of a fighter aircraft.

Pan–America : All the countries of North and South America.

2.9 ASSIGNMENT :

1. Read story of development and success of different aircrafts.

2.10 ACTIVITIES :

1. Collects some photographs andNewspaper Articles of initial days of aviation.

2.11 CASE STUDY : :

Overlooked No More : Bessie Coleman, Pioneering African–American Aviatrix

By Daniel E. Slotnik

In 1921 Coleman became the first black woman in the United States to earn a pilot's license, then barnstormed around the country thrilling audiences and inspiring later generations.

Bessie Coleman was the first African–American woman to earn a pilot's license, thrilling crowds by performing dangerous maneuvers in a rickety airplane and representing, literally, the heights that African–Americans could attain.

But before all that, she was working as a manicurist on Chicago's South Side in 1919 when her brother John showed up drunk one day and began taunting her about her job. John had served in the Army in France during World War I and often teased his sister about how women there had more opportunities. Women in France were so liberated, he said, they could even fly planes.

Black "women ain't never goin' to fly, not like those women I saw in France," he said, as retold in "Queen Bess: Daredevil Aviator" (1993), a biography of Coleman by Doris L. Rich.

"That's it!" Coleman replied, smiling. "You just called it for me."

Determined to prove him wrong, Coleman reached out to several pilots for lessons, but none would accept her as a student. So she decided to go to France, where she thought her race and gender would not be insurmountable impediments.

To prepare for the trip, Coleman studied French, solicited benefactors to help finance the venture and found a higher–paying job managing a chili restaurant. On Nov. 20, 1920, she set off for Europe aboard the liner S.S. Imperator, then enrolled at the flight school founded by the aviation pioneers Gaston and René Caudron at Le Crotoy in the Somme in northern France.

There she began a seven–month course in flying a Nieuport Type 82, a 27–foot–long biplane with a 40–foot wingspan. The plane was fragile, and Coleman had to inspect every part of it each time she went aloft.

The Type 82 in which Coleman trained had one cockpit for an instructor and another behind it for a student. There was no steering wheel; there weren't even brakes. The instructor, and soon Coleman, handled a large wooden stick to control the plane's pitch and roll, and moved a rudder bar with his feet to control its yaw. To stop the plane, the pilot would land, then drag a metal skid on the tail along the ground.

Coleman learned aerial manoeuvres like loop–the–loops, banking and tail spins. She also witnessed an accident that killed another student.

"It was a terrible shock to my nerves, but I never lost them," Coleman was quoted as saying in "Queen Bess." "I kept going."

On June 15, 1921, Coleman received her pilot's license from the FédérationAéronautiqueInternationale, an organization that oversees airborne sports. The license granted her the right to fly anywhere in the world.

Upon her return to New York City in September, The Associated Press heralded her as "a full–fledged aviatrix, said to be the first of her race."

Coleman began barnstorming the country in 1922. She dazzled spectators by walking on the wings while aloft or parachuting from the plane while a co–pilot took the controls. Her stunts were widely covered in the press, especially in black newspapers, and she cut a glamorous figure.

She enjoyed the attention so much that she decided to try acting and was cast as the lead in a film based on her life story. But she turned down the part after learning that the movie began with her character appearing in rags, which she found demeaning and undignified. "No Uncle Tom stuff for me!" she told Billboard magazine.

Coleman saw aviation as a way to empower black people in America and dreamed of opening a flight school. She never did, but future pilots said they had been inspired by her, and flight clubs have been named in her honor.

"I shall never be satisfied until we have men of the Race who can fly," she told the black newspaper The Chicago Defender in 1921, adding, "We must have aviators if we are to keep pace with the times."

Coleman borrowed planes at first, but in time she saved up enough to buy one of her own, a military surplus Curtiss JN–4, known informally as the Jenny. Coleman went to Santa Monica, Calif., to pick it up.

While in California she planned to perform an air show near Los Angeles, but as she took off to fly to the fairgrounds, her motor stalled, and she nose–dived from 300 feet, breaking a leg, fracturing her ribs and destroying her plane. She begged the doctor at the scene to "patch her up" so that she could get to the show. He called for an ambulance.

"Tell them all that as soon as I can walk I'm going to fly!" Coleman wrote in a telegram to her fans.

It took her months to recover, and it was two years before she was flying regularly again.

Coleman lived in Chicago and then Houston, staging air shows all around Texas but increasingly spending time on the lecture circuit, a safer and more remunerative way to make a point about social uplift.

By April 1926, Coleman had saved enough money to buy another plane – another surplus Jenny. She scheduled an air show for May 1, and on April 30 she and her co–pilot, a mechanic named William Wills, took a practice flight in the new plane. Coleman sat in the second cockpit, unharnessed so that she could peer over the side and identify a good place for a parachute landing during the show.

Wills flew the plane at about 2,000 feet for five minutes, then climbed to 3,500 feet. Witnesses said the plane accelerated suddenly, nose–dived, went into a tailspin and flipped upside–down about 500 feet in the air. Coleman fell from the plane and plunged to the ground, dying on impact. She was 34. The plane also crashed, killing Wills, his body pinned under the plane. As rescuers tried to move the plane off him, one lit a match for a cigarette, igniting gas fumes and wreathing the wreckage in flame.

Officials determined that a loose wrench had become jammed in the plane's control gears, causing it to go out of control and crash.

The mainstream press barely noted Coleman's death, focusing instead on Wills, who was white. But many black newspapers gave front–page coverage to her death.

Coleman's body lay in state in Florida and in Chicago, where about 10,000 people paid their respects. The journalist Ida B. Wells, who crusaded against lynching, led the ceremonies.

Bessie Coleman (she sometimes used the name Elizabeth) was born in Atlanta, Tex., on Jan. 26, 1892, to Susan and George Coleman. Her parents worked as day laborers, farmers and cotton pickers. George Coleman managed to save enough money to buy a plot of land in Waxahachie, Tex., in 1894 and built a shotgun house, where he and his wife had several more children.

In 1901 George, who was part Native American, left for Indian Territory in Oklahoma, where he thought he could avoid the racial oppression in Jim Crow Texas. He asked Susan and the children to come with him, but Susan chose to stay in Waxahachie and raise four of their children by herself, earning money as a domestic worker.

Coleman studied in a one–room schoolhouse and, like many families in Waxahachie, picked cotton when the crop was ripe, work that she hated. She left Texas in 1910 to enroll in the Colored Agricultural and Normal University in Langston, Okla., but she ran out of money and returned home after only a semester.

In 1915 she moved to Chicago and became a manicurist. By night she went to clubs in the Stroll, the center of Chicago's black community, where she saw performances by Louis Armstrong, Bessie Smith and other luminaries.

On Jan. 30, 1917, she married Claude Glenn, who was 14 years her senior.

Coleman's story has been told in books, television programs, a French documentary and, earlier this year, an irreverent episode of Comedy Central's "Drunk History," with the actress and comedian Lyric Lewis. In 1995 the United States Postal Service issued a stamp in Coleman's memory as part of its black heritage series. A middle school in Texas and several roads around the country, usually near airports, bear Coleman's name.

But it took time for Coleman to achieve recognition beyond the black community in her day. Mae Jemison, who in 1992 became the first African–American woman to go into space, wrote in an afterword to "Queen Bess: Daredevil Aviator" that she had felt "embarrassed and saddened that I did not learn of her until my spaceflight beckoned on the horizon."

"I wished I had known her while I was growing up," Jemison continued, "but then again I think she was there with me all the time."

In one way Coleman was indeed with her when she left the Earth. Jemison carried a picture of Coleman with her into space, flying far higher than Coleman had ever dreamed.

Questions :

1. What was so special about Coleman by taking up pilot as career in world war era ?
2. How air travel was changing in world war era ?
3. Discuss the Coleman decision of choosing career in aviation industry ?

2.12 FURTHER READINGS :

1. Air Transportation by Wilson & Bryon
2. Air Transportation by Alexander T Wells
3. Air Transport – A Tourism Perspective by Anne Graham, Frederic Dobruszkes
4. Turbulent Skies: The History of Commercial Aviation by T. A. Heppenheimer
5. The Making of St. Petersbergby Will Michaels
6. Handbook Of Tourism Economics: Analysis, New Applications And Case Studies by Clement A Tisdell
7. Commercial Aviation Safety by Stephen Cusick, Antonio Cortes, Clarence Rodrigues

UNIT 03 *Organisation & Trade Association of Air Transportation Industry*

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- To provide the learner with informationand understanding of tourism as a trade.
- To make learner know about players and organisations of tourism.

3.1 INTRODUCTION :

Trade refers to the exchange of goods between individuals, businesses, states, or countries. Local trade refers to trade within a locality or between towns or villages within a state. State–level trade refers to trade between two states. International trade refers to trade between two countries.

International trade is a measure of a country's economic health. Imports are goods purchased from other countries, while exports are goods sold to other countries. A country's balance of trade is the difference between its exports and imports. A country is said to have a favourable trade balance when the value of its exports exceeds the value of its imports. When a country's imports exceed the value of its exports, the country is said to have an unfavourable trade balance.

Tourism is a significant component of international trade. The Indian tourism industry employs approximately 25 million people to care for the approximately 2.6 million foreign tourists who visit India each year. Foreign tourists come to India for a variety of reasons, including heritage tourism, ecotourism, adventure tourism, cultural tourism, medical tourism, and business tourism.

Tourism not only promotes national integration, but it also helps local handicraft industries thrive and foreign tourists understand and appreciate our cultural heritage.

3.2 TOURISM AS A TRADE :

According to the definition of tourism, "the cultural, recreational, and commercial visit to internal areas is known as tourism." Tourism is a type of trade. The arrival of foreign tourists in India generates about 3000 crore in foreign currency. The tourism industry directly employs over 1.5 crore people. An invisible commerce transaction involves the exchange of no physical goods. Invisible trade occurs when services are exchanged. In this situation, tourism is a shadow industry. It involves exchanging services at hotels, restaurants, travel agencies, and banks.

It encourages national integration while also promoting local handicrafts and cultural interests. It also contributes to raising international awareness of culture and heritage. Foreign tourist arrivals have increased, contributing to foreign exchange. Tourism also contributes to national integration. Foreign tourists come to India for a variety of reasons, including heritage tourism, ecotourism, adventure tourism, cultural tourism, medical tourism, and business tourism.

Tourism put its impact on economy of a nation that include the growth and development of various industries that are directly related to a healthy tourism industry, such as transportation, lodging, wildlife, arts and entertainment. This results in the creation of new jobs as well as revenue generated by foreign exchange, investments, and payments for goods and services rendered. Though improvements in the standard of living of locals in heavily visited tourist destinations are usually minimal or non–existent, inflation of basic commodities prices caused by visiting tourists is a constant feature of these areas.

Travel and tourism are major global industries that are expanding. Prior to the pandemic, travel and tourism (including its direct, indirect, and induced effects) accounted for one–fourth of all new jobs created globally, 10.3 percent of all jobs (333 million), and 10.3 percent of global GDP (US$9.6 trillion), according to the WTTC. Meanwhile, international visitor spending in 2019 totalled US$1.8 trillion (6.8 percent of total exports). However, the global pandemic covid–19 arrived as a curse. In 2020, 62 million jobs were lost, representing an 18.6 percent decrease, leaving only 271 million employed globally in the sector, compared to 333 million in 2019. In 2021, 18.2 million jobs were recovered, representing a 6.7 percent increase year on year.Domestic visitor spending increased by 31.4 percent in 2021, following a 47.4 percent decrease in 202. Following a 69.7% decrease in 2020, international visitor spending increased by 3.8 percent in 2021.

This growth in sector due to, as we all know, Tourism not only increases external income and even foreign–exchange income, but various studies have found that it can also rapidly generate job opportunities.

As a result of the various benefits that tourism is perceived to offer, many governments at the local and national levels strive to achieve development in the tourism sector. It is not surprising that such organisations regard economic benefits as the most important measure of tourism, as they can help achieve a positive balance of payments and stimulate tourism–dependent industries, thus benefiting both the local area and the country as a whole.

3.3 PLAYERS OF TOURISM TRADE :

The term "travel trade" refers to tour operators, travel agents, receptive operators, and wholesalers in the tourism industry. These professionals plan and negotiate the purchase of travel products for resale to groups or individuals. Despite the industry's segmentation, there is significant overlap in order to improve customer experience. These professionals plan and negotiate the purchase of travel products for resale to groups or individuals. Transportation, hospitality, travel facilitation and information, attractions and entertainment, and so on are all part of the tourism industry.

Travel Agencies : We've already studied that a travel agency serves as a link between the travel industry and the traveller. A travel agency's function includes marketing pre–packaged travel packages and vacations to potential customers. The travel agency can also act as a middleman between the traveller and hotels, vehicle rental businesses, and tour providers. It could be tiny and individually held, or it could be a component of a bigger corporation.

Travel Agent : A travel agent is the first point of contact for a traveller who is researching and planning to buy packages and experiences from an agency. they are expertise in a variety of activities, such as specialised places, outdoor experiences, backpacking, rail, cruise, bicycle, or gourmet tours, to mention a few. These expertise can assist travellers who require assistance planning their vacations. Some travel agencies have a physical location, while others provide services both online and in person. Travellers can then speak with their agents in person, as well as reach out to them via phone or email. A specialist diploma or degree in travel agent/travel services is normally required of travel agents.

Online Travel Agents (OTAs) : Without the assistance of a travel agency, travellers may now research and book all they require online. People can now choose to book tours with a specific agency or agent, or they can be fully independent travellers (FITs), building their own itineraries, since technology and the internet are increasingly being utilised to sell locations.

Online Travel Agencies (OTAs), organisations that aggregate lodging and transportation alternatives and allow consumers to choose one or more components of their trip based on pricing or other incentives, are becoming more popular among FITs. Booking.com, Expedia.ca, Hotwire.com, and

Kayak.com are examples of online travel agencies. OTAs are becoming increasingly popular among travellers.

OTAs have caused issues for the tourist sector and travel services infrastructure, despite the fact that they can provide lower–cost travel options and the freedom to plan and reserve when customers want. The bulk of popular OTA sites are owned by just a few corporations, as seen by Expedia and Travelocity's merger, raising concerns about a lack of competition across brands. In addition, several OTAs charge a commission to include accommodation providers and operators in their inventory system.

Tour Operator : A tour operator combines all or nearly all of the components of a trip (package) and sells them to the traveller. Retail establishments and travel bureaus can also sell these packages. Tour operators work directly with hotels, transportation companies, and attractions to purchase huge quantities of each component and package them at a lower cost than if the traveller bought them separately. The majority of tour operators cater to the leisure sector.

DMOs : National tourist boards, state/provincial tourism offices, and community convention and visitor bureaus are all examples of Destination Marketing Organisations (DMOs) around the world. DMOs work to support "a destination's long–term development and marketing, with a focus on convention sales, tourism marketing, and service."

With the rise of new planning and booking channels, such as online travel agencies (OTAs), today's DMOs are changing their focus away from travel services and toward destination management.

3.4 ROLE OF ORGANISATIONS IN TOURISM TRADE :

Many different travel and tourism organisations have emerged over the last few decades. Each organisation is unique, from tour operators to airlines to tourist boards to conservationists. Most travel and tourism organisations, however, fall into one of three categories: private, public, or voluntary. They generally include: research; information and promotion within the country; overseas promotional activities; international relations; tourist area development; overall tourism policy and promotion; and support for key tourism interests during a financial crisis. These organisations work in both the private and public sectors.

WTO (World Trade Organisation) also support tourism trades with aim to promote peace and understanding among all nations of the world through tourism by stimulating economic growth and job creation, providing incentives for protecting the environment and heritage of destinations, and promoting peace and understanding among all nations of the world.

The Department of Tourism (DoT), known by different names in different countries, is established to encourage, promote, and develop tourism as a major socioeconomic activity in order to generate foreign

currency and employment, as well as to spread the benefits of tourism to both the private and public sectors.

We have already studies about the regulating bodies of tourism in *Block – I, Unit – 2 BBAATR – 206, Cargo and Logistics Management.* Where we studied about the regulatory bodies which provide guidelines and support for operations. Trade organisations also adhere these regulations from government as well as suggest guidelines as per both private and government regulatory.

NGOs in Indian Tourism Sector : Aside from government initiatives, non–governmental organisations (NGOs) and leading corporations are launching initiatives to promote sustainable development through tourism. The role of non–governmental organisations (NGOs) in tourism is critical because they highlight development imbalances as well as people's perceptions of that development. They raise public awareness about the proper and improper use of their resources and assets in relation to tourism development. Some of them are as bellow.

AAROHI : It is a non–profit organisation that integrates rural development in Uttarakhand's central Himalayan region. Its mission is to provide development opportunities for rural Himalayan communities by providing quality healthcare and education, managing energy and forests, promoting sustainable natural resource use, and revitalising traditional culture.

Aarohi's two–decade journey has been filled with ups and downs, excitement and growth. Saitoli, its headquarters, has evolved into a buzzing hub of positive grassroots action, with work extending as far as Nainital, Almora, and Bageshwar. Aarohi is active in 57 villages and has impacted the lives of over 50,000 people.

EQUATIONS : Equations is an Indian research, policy, and advocacy organisation focused on tourism and development issues. Their research has concentrated on the economic, environmental, social, cultural, political, and administrative effects of tourism, particularly on people who live in and near tourist destinations. They work closely with organisations and people's movements to influence people–centered forms of tourism and policies that ensure significant local benefits while also taking into account the negative effects of unbridled tourism growth.

ECOSPHERE : Ecosphere is an NGO founded by the local community of Spiti in Himachal Pradesh and professionals from various backgrounds with the goal of creating sustainable livelihoods and conserving nature and culture in the hills. Its passion for conservation, mountain travel, and adventure is evident in its desire for the Himalayas' great legacy to thrive so that future generations can enjoy its beauty and bounty as well. It is committed not only to the development of the region's place, people, and resources, but also to the travellers who want to be a part of this endeavour.

GRASSROUTES : The goal of Grassroutes is to encourage responsible travel through rural engagements. Grassroutes directs its efforts toward a social mission of creating one million livelihood opportunities in rural Maharashtra each year. This is accomplished by providing villages with employment and livelihood opportunities while also reducing distress migration. It bridges the urban–rural divide by organising meaningful interactions in which traveller can enjoy organic, home–grown food; participate in local festivals and celebrations; celebrate local arts and crafts, thereby promoting their culture; partake in a rustic, authentic way of life by drawing water from a well, milking a goat, chopping wood, and learning sustainable farming techniques from a local.

INDIA UNTRAVELLED : India Untraveled is a social enterprise that aims to bridge the gap between socially responsible tourism in rural India and urban travellers seeking authentic travel experiences. It is on a mission to introduce visitors to a side of India that few have seen. They cover many rural parts of India with untouched natural beauty, where locals revere traditional practises and are willing to teach visitors how to live another way.

The rural home–stays and farm–stays allow travellers to immerse themselves in the vibrant culture of India's villages, indulge in delectable local cuisines, explore centuries–old indigenous art forms, and learn about the region's folk music and dances, local legends and stories.

WWOOF INDIA : WWOOF India (Worldwide Opportunities on Organic Farms) is a network that allows volunteers to live and learn on organic properties and farms. It brings together hosts and volunteers who work together to make the world a healthier place. It was founded in 2007 with the goal of facilitating cultural and educational exchanges by connecting domestic and international travellers with approximately 240 organic– or sustainability–minded hosts spread across 16 Indian states. All of the hosts in their network are involved in organic gardening, orchards, spices, tea, and other environmental projects.WWOOF India also promotes sustainable livelihood methods and addresses poverty issues. It contributes to the generation of income and the improvement of the basic quality of life in rural areas by promoting activities that depict the cultural, artistic, and ecological dimensions of rural life in India.

International NGOs

AMFORHT : AMFORHT, or the World Association for Hospitality and Tourism Education and Training, is a global ethical network focused on education and training for the tourism and hospitality industries. This is a non–governmental organisation founded in 1969 on the initiative of the World Tourism Organization and in collaboration with the United Nations Economic and Social Council (ECOSOC) (UNWTO).It is now the only global network for all essential actors in Hospitality, Culinary Arts, and Tourism Training and Education.

AMFORHT strives to strengthen ties between major participants in the tourism sector from across the world, including education institutions (hotel schools and universities), industry, specialists, and institutions dedicated to education and tourism.

FRIENDS–INTERNATIONAL : Friends–International is an international non–governmental organisation that works to empower marginalised children all over the world. Recognizing that growing tourism in Asia can endanger vulnerable children, Friends–International seeks to ensure that child protection is incorporated into and implemented within sustainable tourism strategies. They also offer advice on preventing child exploitation and abuse in all areas of business. They also aim to improve corporate operations and human resource procedures by incorporating child welfare into existing products/services and refining ethical codes and hiring practises.

Many of the fundamentals that allow the tourism industry to function are provided by public organisations. All of these travel and tourism organisations collaborate with other organisations to ensure that rules and regulations are followed, that the highest level of service is maintained, transportation and connectivity development, revenue and profit generation, corporate social responsibility, sustainable tourism development, and so on.

3.5 TOURISM SERVICES :

Tourism and travel–related services include those provided by hotels and restaurants (including catering), travel agencies and tour operators, tourist guide services, and other related services.

Many organisations are contributing to tourism development. Sector–specific associations, educational institutions/providers, tourism and hospitality HR, economic development and city planning offices, consultants, and government departments are among them.

Supporting organisations such educational and training institute creates trained young minds as well as to the employee already working there. Employer also understand the fact that improved staff attraction/ recruitment, retention, engagement, and innovation are all key benefits of training. Employees receive customer service training to lay the groundwork for excellent service delivery. Potential benefits of this training may include improved skills and attitudes; better communication skills; better understanding of workplace practises; increased morale, confidence, self–satisfaction, and work satisfaction; increased participation; greater job/career advancement potential; greater interest in and willingness to participate in further training; and more independence

Several non–profit and for–profit organisations drive the growth of specific segments of tourism industry. HRAs, TFCI, FHRAI, HAI, and so on are few contributing specifically. To support the industry, various organisations with various names exist in various countries. These

organisations function as regulatory bodies, advocacy organisations, certification providers, and information sources.

Land use, planning, development, environmental, transportation, and other related government branches and ministries are also assisting in tourism development.

Independent consultants and consulting firms are unseen layer of the travel services sector. Individuals, small–scale businesses, and international corporations all provide services to the industry in a business–to–business format.

Transportation : People can use transportation to get from a tourist–generating location to a tourist–destination area. There is a transit route in the middle. There are various means of transportation available, including road, rail, water, and air transportation. Road transportation was once more popular than trains or waterways. The invention of transportation facilities gave rise to the concept of travel. Accessibility is determined by the distance between population centres, which serve as tourist markets, and external transportation and communication, which allows a place to be visited.

Hotels : One of the most important aspects of a destination is its accommodation. Any traveller planning a trip to a new location will first look for accommodations that meet his or her needs. It should satisfy him/her with food and beverage services, resting facilities, and so on.

Restaurants and Bar : Restaurant serves enjoyable food and a relaxing atmosphere to get satisfied customer. Bar are specialised in serving alcoholic beverages such as Wines, Beer, Whisky, and Vodka and so on along with cocktails.It can be on–premises of accommodation as well as independently operating establishment.

Guide : Tour guides accompany groups of tourists to tourist places, whether on day trips or longer stays, and provide information and insights to help them get the most out of their visit. They also take groups or individuals on trips to historical sites, museums, geographic attractions, and outdoor activities. They are well versed with cultural, historical, and practical knowledge that they share with visitors some guides are specialised in particular segment likeClimbing, river rafting, fishing and so on. Guides are frequently hired by businesses and organisations to offer tourists with a memorable experience.

❑ **Check Your Progress :**

1. A country is said to have a favourable trade balance when the value of its _____.

   a. Imports exceeds to exports

   b. Exports exceeds to imports

   c. Exports and imports are equal

   d. No exports or imports

2. Which of the following is an NGO that bridges socially responsible tourism in rural India to the urban travellers for authentic experiences?
   a. Equations b. Grassroutes
   c. India Untraveled d. WWOOF India
3. Restaurants provide mainly :
   a. Accommodation b. Alcoholic beverages
   c. Dance and Music d. Food and Beverage
4. Which of the following have a goal encourage responsible travel through rural engagements ?
   a. Grassroutes b. WWOOF India
   c. Aarohi d. Equations
5. Which of the following is an international NGO that works to empower marginalised children all over the world.
   a. WTO b. Aarohi
   c. AMFORHT d. Friends–International
6. Which of the following organisation is working for organic farming ?
   a. WTO b. WWOOF India
   c. TFCI d. Friends–International
7. Ecosphere is an NGO founded by the local community of Spiti in the state of _____.
   a. Maharastra b. Andhra Pradesh
   c. Himachal Pradesh d. Uttarakhand
8. Which of the following NGO has its mission to provide development opportunities for rural Himalayan communities in Uttarakhand ?
   a. Ecosphere b. Aarohi c. Equations d. Grassroutes

3.6 LET US SUM UP :

Tourism is a type of trade. The arrival of foreign tourists in India generates about 3000 crore in foreign currency. The tourism industry directly employs over 1.5 crore people. Tourism is important to nearly all WTO members, particularly in terms of employment, GDP, and the generation of foreign exchange. Tourism–related services are typically labour–intensive, with numerous connections to other major economic sectors such as transportation, cultural and creative services, or financial and insurance services. Tourism is a largely unnoticed industry. It entails exchanging services at hotels, restaurants, travel agencies, and banks.

It promotes national integration while also supporting local handicrafts and cultural interests.It also helps to raise international awareness of our culture and heritage.Participating in familiarisation tours is one method tour operators, DMOs, and travel agents collaborate (FAMs for short). These are usually organised by the local DMO and include visits to

various tour companies throughout the region. Media, travel agencies, RTO representatives, and tour operator representatives can all attend the FAM. The objective of a FAM is to familiarise guests with the tour product or experience so that they may promote or sell it to potential guests. FAMs are typically low–cost or free for guests.

3.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. b	**2.** c	**3.** d	**4.** a
5. d	**6.** b	**7.** c	**8.** b

3.8 GLOSSARY :

Community Destination Marketing Organization (CDMO) : A DMO that represents a city or town.

Destination Management Company (DMC) : A company that creates and executes corporate travel and event packages designed for employee rewards or special retreats

Destination Marketing Organizations (DMOs) : Also known as destination management organizations; includes national tourism boards, state/provincial tourism offices, and community convention and visitor bureaus

Fully Independent Traveller (FIT) : a traveller who makes his or her own arrangements for accommodations, transportation, and tour components; is independent of a group

Inbound Tour Operator : An operator who packages products together to bring visitors from external markets to a destination

Online Travel Agent (OTA) : A service that allows the traveller to research, plan, and purchase travel without the assistance of a person, using the internet on sites such as Expedia.ca or Hotels.com

Outbound Tour Operator : An operator who packages and sells travel products to people within a destination who want to travel abroad

Receptive Tour Operator (RTO) : someone who represents the products of tourism suppliers to tour operators in other markets in a business–to–business (B2B) relationship

Regional Destination Marketing Organization (RDMO) : In BC, one of the five DMOs that represent a specific tourism region

Tour Operator : An operator who packages suppliers together (hotel + activity) or specializes in one type of activity or product

Tourism Services : Other services that work to support the development of tourism and the delivery of guest experiences

Travel Agency : A business that provides a physical location for travel planning requirements

Travel Agent : an individual who helps the potential traveller with trip planning and booking services, often specializing in specific types of travel

3.9 ASSIGNMENT :

1. Choose an association that is representative of the sector you might like to work in (e.g., accommodations, food and beverage, travel services). Explore the association's website and note three key issues it has identified and how it is responding to them.
2. With an increase growth in mobile technology, how are travel services adapting to suit the needs and/or demands of the traveller?

3.10 ACTIVITIES :

1. Choose a local tourism or hospitality business and find out which associations it belongs to. List the associations and their membership benefits to answer the question, Why belong to this group?

3.11 CASE STUDY :

Tourism Finance Corporation Of India (TFCI) :

Spanning A Trek Alongside TFCI's Illustrious Journey As India's Premium NBFC

Outlook Web Desk, 29 JUN 2021

The Swift Rise of the Tourism Sector in India

India has been a travel haven, for tourists and travelers throughout the world, right from ancient times to the present day, owing to its rich cultural heritage and boundless beauty. With a diverse mix of majestic mountains, roaring rivers, valleys, deserts, forests, lustrous lakes, breathtaking beaches and tropical islands, this country has all that a vacationer seeks and is bound to cherish for a lifetime.

Hence, owing to this fact and the limitless possibilities it presents, the Tourism Sector in India became one of the most crucial in the country, spearheading the nation's economy. According to The World Travel and Tourism Council (WTTC), tourism generated $194 bn or 6.8% of India's GDP in 2019 and supported 39.80 Mn jobs which is 8 % of its total employment, in the Pre–COVID World.

TFCI – India's Premium Tourism Financing Institution

Given the extraordinary growth that tourism in India was likely to undertake, it was only natural for the leaders of Independent India to lay groundwork on building a structure that will continue to bring in revenue and boost the economy of the country. With this end in mind, the National Committee on Tourism began to lay brick upon brick in the form of policies to boost Tourism in India.

The final outcome of this work was the birth of Tourism Finance Corporation of India (TFCI), a specialized financing institution, set–up

in 1989, which has since been instrumental in the creation of tourism infrastructure throughout the country, generating thousands of employment opportunities and buzzing tourism hubs.

Over the last three decades, TFCI played a pivotal role in developing tourism infrastructure in the country through funding to diverse segments including niche areas such as – heritage tourism, cruises, adventure, medical, wellness, sports, MICE, eco–tourism, film, rural and religious tourism etc.

TFCI : TFCI has acted as a catalyst in the creation of infrastructure in the Indian hospitality segment since its inception. It has also enabled various businesses to channelize their investments into different segments and locations of the tourism industry. Set–up by a group of government organizations like IFCI, LIC, OIC, SBI, BOI, Canara Bank, etc., TFCI played an active role in creating many firsts in the Tourism sector for the country, with projects that have proved to be some of the most popular tourism attractions in India. Some of these firsts include the Indian Railways' Palace on Wheels, Esselworld, Spa cum wellness resort Ananda in the Himalayas and many more, that are indeed known as one–of–a–kind offerings in the hospitality sector globally today.

The premier financing institution has assisted plethora of branded hotels in India till date and has been associated with almost all major domestic as well as international brands like ITC, Leela, Taj, Lalit, Lemon Tree, Hyatt, Marriott, Hilton, Radisson, Holiday Inn, etc.

With a view to create the necessary infrastructure and augment demand, TFCI has also acted as an advisor to the Central Government of India & multiple State Governments and their affiliated agencies to help tourism flourish in the country.

To name a few undertakings, it has been associated with Ministry of Environment & Forests (GoI), Government of Gujarat, Gujarat State Tourism Development Corporation, Tamil Nadu Tourism Development Corporation, MP State Tourism Development Corporation Ltd., Delhi Tourism Transport Development Corporation, Jharkhand Tourism Development Corporation, Government of Himachal Pradesh etc. TFCI had also advised Ministry of Railways for launching and managing pan–India luxury train services.

An all–inclusive growth

TFCI has been in the forefront to assist in building a sustainable infrastructure to bridge the divide between financial constraints and upcoming projects. In order to drive an inclusive growth, one of the key long–term visions of TFCI is to build sustainable growth strongholds for Micro, Small and Medium Enterprises (MSME) in the country. MSME segment continues to benefit and strengthen itself with ample assistance in the form of financial lending from TFCI, which has nearly 90% of its hospitality portfolio from the MSME category itself.

As a specialized NBFC, TFCI has a vision to fully utilize the potential of tourism in India and roll the wheels of economic growth faster to enable generating more opportunities for employment and sustainable livelihood. This has paved the way for successful execution of promotional activities at tourist attractions, clarity in true assessment of market potentials, building of sustainable infrastructure and feasibility studies. As a part of its lending philosophy, TFCI continues to provide financial services and create value within the Hospitality and allied sectors. These are believed to not just create the right environment towards better tourism but also generate more employment, thereby giving another boost to the economy.

Providing Exceptional Service Amidst COVID–19

Dreams are fulfilled with hard work and TFCI has been able to expand its foothold onto the tourism landscape by assisting more than 900 projects till date. Further, as the country starts to recover from the COVID impact, several affected tourist destinations are getting back on their feet. In these unprecedent times, TFCI has proactively assisted its existing portfolio by extending support through additional financing under various schemes like Government guaranteed ECLGS scheme, RBI Covid package besides extending additional financing wherever required to enable the borrowers to tide over temporary liquidity mismatches till stabilization of operations.

During the pandemic, its exceptional service led by eminent leaders with diverse experience became the greatest asset and strongest pillar of support to cross over the Covid 19 situation, providing a firm backbone for the hospitality domain amidst tough times.

Whilst continually offering its services amidst the crisis, TFCI also managed to continue healthy profitability. As on 31st March 2021, its Loan Book stood at Rs 1,977 Cr (of which 84% is towards MSME segment) with fresh disbursements of Rs 457 Cr in FY21. It remained robust financially, despite the challenging environment, with a Profit After Tax of Rs. 81 Cr. during FY21.

Furthermore, around 79 % of its asset under management was towards tourism and allied sectors with exposure in hotels, resorts, convention centers, restaurant chains, amusement park, etc. Government led initiatives like introduction of ECLGS scheme, providing great relief to contact intensive sectors like hospitality, etc. are likely to play pivotal role in quickly reviving the growth numbers to what they were before the pandemic, through the proactive assistance of TFCI.

TFCI : A Unique Success Story Creating Countless Success Stories :

The Tourism sector has been recognized as a key contributor to the country's GDP, with an ever–increasing capacity to employ millions in the strong MSME segment. TFCI has been instrumental in the same, through its role in funding countless MSME Projects across the country.

India's leading Financial Institution was also instrumental in funding the restoration and transformation of Royal Heritage sites such as UmaidBhavan, Devigarh Fort, Chomu Haveli, JehanNuma Palace into successful Renovation projects. Entertainment Centers and Waterparks such as Nicco Park, Shanku's Water Park, Kishkinta – Kingdom of Fun, Black Thunder Water Park, Worlds of Wonder, to name a few, were made a reality with the assistance of TFCI. Premier hospitality properties like Taj Exotica in Goa and CHG Marari Beach in Kerala are stellar examples of efforts that saw immense success with assistance from TFCI.

What makes TFCI stand out, is the brilliant and highly experienced and professional/independent team of board members. The executive team, led by Mr Anirban Chakraborty (MD&CEO) has the required sectoral knowledge that ensures that feasible tourism projects are flawlessly conceptualized and structured to yield value to all stakeholders. A key benefit of partnering with TFCI is that it is well aware and takes due recognition of the unique funding requirements of this industry including longer gestation period, seasonal cashflows etc. thereby appropriately structuring each deal.

Flying Higher…

As a premier institution that has extensively promoted the infinite scope of Indian Tourism, TFCI is in an exciting place today. It is also aiming to diversify further post Covid–19, with a view to expand its offerings in other related sectors viz., healthcare, education, logistics, etc., without compromising on its strength as a major lender for tourism sector. The institution is now looking forward to go beyond tourism financing and is looking at TFCI 2.0: Diversifying for Growth.

At TFCI, the Aatmanirbhar Bharat mission is increasingly becoming the leading voice that witnesses a passion to drive growth amongst MSME segments and ensure that the backbone of the country's economy is well funded and provided with diligent guidance. In line with its boundless growth and ambitious expansion plans, TFCI will be looking at various financing options for the MSME sector, including acquisition financing, structure financing and also pursue activities to enhance the fee–based income. The Company intends to grow its balance sheet size by aggressively pursuing the emerging opportunities which would enable it to leverage its capital (CAR of 39.87% as on March 31, 2021) and thereby improve return on equity.

With three decades of Industry leadership, robust growth and committed allied partners, TFCI embarks and continues to achieve its objective of making India the most favored and loved travel destination for tourists around the globe. On the asset side, it has a portfolio of long–standing relationships who greatly value the association and the support shown by TFCI during this pandemic.

As India and the world recover from the recent crisis, TFCI remains a great pillar of strength for the country's Tourism Segment, as it bounces

back from its COVID aftermath. With a solid foundation, TFCI has a steady vision to actively back and fiercely support upcoming ventures in the Indian Hospitality domain and allied sectors. It continues to create a legacy of spearheading exceptional projects that have transformed Indian Tourism, whilst being synonymous with expansion, diversification, and modernization.

Questions :

1. What is the role of TFCI in developing tourism post Covid time ?
2. How TFCI ensure all inclusive growth in tourism sector ?
3. Analyse the working of TFCI and how as a young entrepreneur one can advantage from it.

3.12 FURTHER READINGS :

1. Tourism: principles, practices, philosophies by Charles R. GoeldnerJ. R. Brent Ritchie
2. WTTC's latest annual research
3. Hotels for Tourism Development by Jag Mohan Negi
4. Successful Tourism Management (Vol. 1 &2) by P.N. Seth
5. Tourism – The Business of Travel – 1 by Roy A. Cook, Laura J. Yale, Joseph J. Marqua

UNIT 04 Issues, Challenges & Trends in Air Transportation

UNIT STRUCTURE

4.0 LEARNING OBJECTIVES :

- To provide the learner with informationabout factors putting impact on aviation industry.
- To make learner understand aboutreasons for congestion and delay.

4.1 INTRODUCTION :

The developments airline industry in future will focus on improving the customer experience and instilling confidence in travellers. Customers interact with airlines through a variety of channels is a strategy to create future loyalty at every touch point where they may provide ease and maybe even delight.

Reducing air transportation system congestion and delays has been a long–term public policy aim that has become more essential in recent years as air travel demand has increased. Similarly, many small communities keen to promote economic development but unable to afford or justify substantial public investments in airport infrastructure have long sought more dependable, convenient, and economical air service. The possibility of improving aviation system capacity and coverage with minimal public infrastructure investment through sophisticated technology used to private small aircraft is enticing, but it requires further consideration.

The difficulties that the air transportation industry faces go beyond the need to reduce congestion and improve service quality and coverage.

The necessity to assure air transportation system safety and environmental compatibility are two particularly significant challenges. Whether the proposed system has the ability to improve air transportation's overall safety and environmental compatibility.

4.2 CONGESTION AND DELAY :

Flights can be delayed or cancelled due to weather, maintenance issues, or personnel issues. This hazy mix of problems, which can range from too few crew members or a shortage of pilots to bad weather to plane shortages, plagued airlines last spring and summer as they attempted to add more flights to their schedules.

While guaranteeing security is the most pressing concern for the aviation industry, the optimal utilisation and distribution of the country's airspace and airport capacity are long–term public policy imperatives. Flight delays caused by system congestion and other reasons have been a source of annoyance and expense for air travellers and the aviation industry for the past decade. The most common complaint received from travellers is flight delays, which account for around 40% of all complaints. According to certain data sources, one out of every four flights is cancelled. This featured flights that were delayed, cancelled, or diverted due to a variety of factors including airport and airway congestion, extreme weather, and aircraft mechanical issues. More than 1.3 million planes were delayed in arriving at their destinations, with an average delay of 52 minutes, affecting over 160 million passengers. The FAA and the Air Transport Association, which represents major airlines, estimate that delays cost airlines and customers more than $5 billion.

It is for airlines and passengers, frequent delays and the unpredictability of scheduling in the commercial aviation industry are some of the key issues. Although the frequency of delays varies by airport, city, and region of the country, delays in one site can have ripple effects throughout the system due to the interrelated nature of aircraft and passenger flows. Due to the enormous number of probable reasons and the system's interconnectedness, recognising the causes of delay is difficult; yet, it is necessary for developing solutions.

Tracking the Incidence, Severity, and Source of Delays

The FAA uses its Operations Network to collect data on flight delays in order to analyse the performance of its air traffic management system (OPSNET). After coming under FAA air traffic management, aircraft that are delayed for 15 minutes or more compared to their intended flight periods are manually recorded (for instance, once the pilot has requested FAA clearance to taxi out for departure). Arrival, departure, and en route delays are recorded; delays caused by an airline's own operations, such as aircraft maintenance, passenger boarding, or a late–arriving flight crew, are not recorded because they are unrelated to air traffic control performance. Similarly, flights that are cancelled for any reason are not counted in OPSNET.

The FAA characterises an airport as having significant delays when 3 percent or more of planes in the air traffic control system are delayed by at least 15 minutes on arrival or departure, according to OPSNET statistics.Weather, air traffic control or airport equipment problems, closed runways or taxiways, high flight volumes in the terminal area or regional traffic control centre, or "other" are all listed as causes of OPSNET delays by the FAA. The fact that delays might have various causes and contributors complicates such classifications.

Weather is the primary cause of air traffic control–related flight delays, accounting for more than two–thirds of departure and en route delays. High traffic volume is the next most prevalent reason of delay, accounting for 12 percent of all delayed flights. The FAA's OPSNET data excludes late flights (or flight cancellations) caused by delays in refuelling, passenger boarding, baggage loading, maintenance, or other airline–related activities, the data do not accurately reflect travellers' experiences. The Department of Transportation compares real departure and arrival times to those advertised in airline schedules to get a fuller picture of delays at the country's busiest airports.When a flight does not draw back from the gate within 15 minutes of the scheduled departure time or return to the gate within 15 minutes of the scheduled arrival time, it is classified as delayed. Although airlines have increased the time stated between arrivals and departures in their published schedules to better reflect actual experience, the DOT data demonstrate how delays vary by airport. Whereas the FAA's OPSNET data shows that delays affect 1 to 10% of operations at most large airports, the DOT's on–time performance data shows that delays affect 15 to 30% of flights.

These findings suggest that air traffic control and capacity issues account for only a portion of delays and that other factors, such as airline operations, play a role. As a result, improvements in airport infrastructure and air traffic control performance may reduce delays, but not all–or even most–of them.

The use of hub–and–spoke systems influences the frequency and severity of delays. Although these systems have proven to be highly efficient in configuring air transportation networks, they contribute to the strains placed on the national airspace system, particularly at some of the major hub airports that serve as transfer points for much of the system's traffic.

Almost all airlines route the majority of their flights and passengers through a small number of large hub airports. The occurrence of these clustered transfers, known as connecting banks, causes an uneven distribution of demand at the hub airports. Flights arrive and depart in waves, which can overwhelm runway, taxiway, gate, and air traffic control capacity, especially when combined with inclement weather or other capacity–restricting conditions. When runway capacity at a major hub airport is severely reduced, air traffic controllers frequently implement

"ground holds," which can cause aircraft to depart from dozens of other airports to be delayed.

Increased passenger traffic means more demands on scarce runway space at major airports and on air traffic control, which could exacerbate system congestion and delay. However, it is important to recognise that worsening aviation congestion due to traffic growth has been a concern for decades, and that the aviation system has, for the most part, responded without incident. Airports elsewhere have been able to adapt without such artificial constraints due to ongoing improvements in their operational capabilities, as well as those of air traffic control and airlines.

Future strategies for increasing system capacity to meet rising traffic demand are likely to focus on eliminating chronic bottlenecks, which would be accomplished through targeted improvements in airport infrastructure, air traffic control capabilities and procedures, and airline operating practises.

4.3 FACTORS IMPACTING THE AIRLINE INDUSTRY :

Despite rising levels of airborne passenger and cargo traffic, the global airline industry's revenue has grown slowly over the last five years as volatile fuel prices and rising competition have put downward pressure on airline ticket prices and freight shipping rates, stifling industry revenue growth. Furthermore, the total value of global trade has fallen in the last five years, reducing demand for cargo transportation services. At the same time, recent increases in global per capita income have fuelled the airline passenger transportation market. Moving forward, industry revenue is expected to grow as global per capita income and travel activity continue to rise, supported by economic growth in Asia and other emerging markets.

The global airline industry never fully recovered from the 9/11 attacks. This was compounded by the prolonged recession that followed the burst of the dotcom bubble. The fluctuations in oil prices caused by the Second Iraq War, as well as the subsequent spike in oil prices just before the Great Recession of 2008, were also debilitating factors. The ongoing global economic slowdown has resulted in declining passenger traffic, competition from low–cost carriers, high aviation fuel prices, labour demands, and soaring maintenance and operating costs for already struggling airlines. All of these factors have resulted in loss–making airlines that are vulnerable to bankruptcies and closure because they can no longer afford to run their operations profitably. This has resulted in increased airline consolidation as they seek to capitalise on the efficiencies of economies of scale and the synergies of mergers with other airlines.

Regulations and restrictions related to international trade, tax policy, and competition have a significant impact on the airline industry. It is also influenced by issues such as war, terrorism, and disease outbreaks such as Ebola. These are political issues. As a result, government intervention is required. In this and the following parts of the series, we'll

look at two major events that had a significant impact on the airline industry in the United States: the 2001 terrorist attack and deregulation in 1978.

The political environment in which airlines operate is highly regulated and skewed in favour of passengers over airlines. This is due to the fact that the global aviation industry operates in an environment where passenger safety is paramount and where the airlines' previous tendencies toward monopolistic behaviour have made the political establishment weary of the airlines, leading to tighter regulation of the airlines' operations. Furthermore, the global aviation industry is characterised by deregulation on the supply side, which means more competition among airlines, and regulation on the demand side, which means passengers and fliers can press for more amenities at lower prices.

The number of lawsuits filed against airlines by both customers and employees has increased in recent years. Furthermore, regulators are becoming more stringent with airlines, which means that they are becoming increasingly wary of their strategies and only implementing them after they are completely convinced that they are not violating any laws. Apart from the legal system becoming intolerant of delays, safety issues, and other aspects, the "double whammy" of increased regulation and more expensive lawsuits has only served to heighten the airlines' fears as each and every move of theirs is being scrutinised.

In recent years, the emergence of the Millennial generation into the consumer class has meant that the social changes of a generation used to entitlement, instant gratification, and more demanding in terms of service have resulted in airlines having to balance their costs with the increasing demands from this segment. In addition, the retirement of the Baby Boomer generation has resulted in the airlines losing a lucrative source of income. Next, the passenger profile has changed, with more budget–conscious passengers and fewer business–class passengers who prefer to use improved communication facilities to conduct meetings remotely rather than flying down to meet their business partners.

Passengers are now counting their carbon footprint as climate change enters the public consciousness, making them more environmentally conscious. As a result, airlines have been forced to adopt "green flying" and become more sensitive to environmentalists' concerns. Furthermore, as consumers and activists turn a critical eye to airlines and their corporate social responsibility, social responsibility initiatives are becoming more pronounced and under scrutiny.

Though the airline industry makes extensive use of technology in its operations, it is limited to aircraft and airline operations, excluding ticketing and distribution. Many experts have urged airlines to use technological advances in the front office and customer–facing functions. In other words, technological changes in ticketing, distribution, and customer service must be adjusted to include mobile technologies. Furthermore,

airlines must leverage social media to ensure that border social and technological changes do not pass the airline industry by.

4.4 CHALLENGES FACED BY INDUSTRY :

A delay on one aircraft will probably result in additional delays on all following planes. The operating costs associated with delay propagation are more than anticipated. Delay propagation is a frequent occurrence.Consumer demand prediction is inherently challenging. Airlines publish their flight itineraries one season in advance. Medium– or long–term demand predictions, which are frequently used for route planning and fleet management, may involve forecast errors.Flight delays and cancellations are frequently brought on by uncertainty, which is seen in daily airline operations. Airlines use disruption management as a decision–making process to deal with these uncertainties and lessen their effects.

Airline deregulation, liberalisation, inclusion of foreign airlines, Overcapacity, emergence of LCCs, Fuel Efficiency etc. have changed the face of industry. These have contributed in development of the industry. However, in addition of these labour unrest, terrorism, global congestion at airport etc. are putting challenge and creating challenges for the development.

Airline Deregulation and Liberalisation : As the pressures of globalisation on air services have increased, many countries have reduced their economic regulations to allow for more competition. Approaches to these reforms have ranged from complete rapid airline deregulation to gradual liberalisation, as seen in the US, Canada, and the European Union. Open Sky agreements, which promote a free market approach to international air service agreements, are gaining traction around the world.

Alliances : Foreign airlines can now form strategic alliances as long as the agreements are legal and do not violate the countries' anti–merger and acquisition laws.One goal of these alliances is to enable seamless service, in which passengers can buy a single ticket, check their luggage once, and fly on multiple airlines around the world. The member airlines coordinate their schedules to reduce passenger wait time while increasing load factor and the service's economic viability. Airlines that participate in the programme may also combine elements such as aircraft maintenance, purchasing reservations, and catering functions. These alliances' economic rationale includes economies of scale, density, and scope, as well as lower unit costs and more competitive service.

Fuel Efficiency : For nearly three decades, aviation fuel availability and costs have been major economic factors affecting the airline industry. High jet fuel prices have a direct impact on the airline's financial portfolio. With the number of airline companies increasing year after year, fuel prices were at an all–time high, creating a vicious circle. Because alternative fuels haven't had much of an impact, maintaining fuel efficiency is one of the aviation industry's key challenges.

Fuel prices continue to be the most pressing concern for the airline industry in the modern era. Because of the high costs, many airlines have imposed fuel surcharges on their customers. According to industry analysts, most airlines' bottom lines are suffering as a result of rising fuel prices.

Congestion : Air travel used to be an expensive luxury, the preserve of the wealthy, especially in developing nations. The situation has radically altered; today, airports all around the world are so packed that it causes flight delays. The majority of flights appear to be full, terminals are frequently crowded, and most significantly, there are far too many aeroplanes in the sky. The airline industry has several significant issues, including air traffic and airport congestion, for which there appears to be no workable answer, at least not in the near term. Although carriers keep making travel easy for passengers, this will always be a challenge.

Overcapacity : A number of airlines, including TWA, have already gone out of business due to issues such as overcapacity. Most major airlines continue to struggle to keep up with the industry's constant changes, and many carriers have been criticised for being slow to adapt to the changing economic environment. Airlines have had to suffer from rock–bottom fares as a result of overcapacity, which may delight flyers but not the airlines. These fares directly contribute to a major revenue problem, which is already being exacerbated by high fuel costs.

Labour Unrest : A number of European airlines have suffered as a result of issues such as pilot walkouts. A 14–day pilot strike recently hit both Air France and KLM, reducing earnings by nearly 500 million euros. Even Lufthansa has complained about the pain caused by pilot walkouts, with issues like these outweighing the benefits of lower oil prices in recent years. For every airline the most important aspect of company is its employees. As a result, poor labour relations can financially and operationally cripple an airline.The pilot shortage is real, and some airlines are already feeling the effects. Regional carriers are bearing the brunt of the shortage. However, if this trend continues, mainline carriers may be affected as well.

The Emergence of Low–Cost Carriers : Low–cost carriers operating in the area have benefited greatly from the issues faced by many of the major operators. Low–cost carriers like EasyJet were able to raise their pre–tax profit projection while Air France employees were on strike. Ryanair, the largest low–cost airline in Europe, has also demonstrated resilience while under strike pressure from rival full–service carriers.

A major factor affecting an airline's unit cost is the size of the aircraft. The direct operating expenses per passenger of an aeroplane decrease with increasing size. The seat density of the aeroplane has significant financial ramifications. Aboard order to sell more seats, LCCs have a larger capacity than FSCs and offer narrower seating in the aircraft.The physical comfort of the passengers is decreased when the aeroplane has more seats. Their affordable rates attracts more passengers as compare to FSCs and hence putting stiff competition in the market.

Global Economy : One of the main issues facing the airline industry is the health of the global economy. For instance, the size of the aviation industry was severely impacted by the economic downturn of 2008. Travel and fuel expenses rise as the world economy deteriorates, while passenger volume declines. One of the main economic variables affecting the airline business is the effect of the recession on the tourism sector.

Terrorism : Tragic prior incidents have spread terror among airport staff as well as the general populace. Despite a recent decline in terrorist attacks, airline firms must continue to be on high alert because this threat still exists. There are lengthier line–ups and delays as a result of tighter check–in procedures brought on by rising anti–terrorist sentiment. Additionally, it puts pressure on airlines to develop ultra–secure, cutting–edge screening methods and tools.

Natural Disasters : Natural disasters like pandemic, hurricane etc. also impacted industry. Prior to COVID, airline firms had a number of difficulties for which remedies were periodically considered and evaluated by specialists in the field. However, the onset of the pandemic presented the aviation industry with a unique set of difficulties that it had never faced in any of the prior major catastrophes, such as the 9/11 attack or the 2008 financial crisis. It has not only resulted in a complete 180–degree shift in how prior issues were regarded, but it has also created a new set of dangers that will now serve as the foundation for how the sector will operate in the decades to come.

Texas was devastated by Hurricane Harvey. The massive hub of United Airlines in Houston, along with almost 10,000 of its staff members, were trapped in the storm. Thankfully, the airline and its staff were able to resume its operations. But as our climate changes, there have been a lot more extreme weather occurrences.

4.5 CURRENT SCENARIO :

The modern aviation sector increasingly operates in a liberal market environment. Government restrictions on prices, market access, and capacity are gradually and nearly generally being lifted or eased, even though they still exist in many smaller countries. Although progress on the open market, whereby nationality of ownership of airlines is unlimited, is taking longer than expected, it is heading toward wide Open Skies formulations that allow free provision of services between the countries involved.

The Emirates Group, China Airlines, American Airlines Group Inc., Delta Air Lines Inc., United Airlines Inc., Singapore Airline, China Southern Airlines, Qatar Airways Company Q.C.S.C., Air France–KLM, and Lufthansa Group are significant players in the market for air transport services.

The market for air transportation services in Asia Pacific was the largest in 2021. The market for air transportation services' second–largest region was North America.

With ongoing privatisations of airports and air traffic control systems or the use of franchising mechanisms to enlist private capital and expertise, the provision and operation of air transport infrastructure is likewise moving toward a more market–driven model. Additionally, it is getting more organised.

The scale, nature, and geography of demand in global markets have led to significant shifts, but also on the supply side, where implicit and explicit international policy coordination by governments and the private sector has affected the institutional and technological environment in which air transport services are provided. The implications of globalisation in its many manifestations have been profound for the international air transport industry.

International air transport demand and supply curves are impacted by Open Skies rules, which also permit strategic partnerships and remove the capacity constraint. On the demand side, the Open Skies policy also has stimulating impacts. Through the concentration of traffic at international hub airports, it is possible to feed transatlantic services more efficiently, expanding the geographic market served and generating scale and scope economies. Need for international air services is pushed out by the bigger physical market demand and typically the enhanced quality of the "product" that goes along with more integrated services, such as code sharing, interchangeable frequent flier programmes, common lounges, and via baggage checking.

Current Scenario in India :

In India, where there is a small population, air travel was previously restricted. However, recent statistics indicate that the Indian air transportation industry is seeing a boom. Over the previous ten years, the industry has seen enormous growth.Numerous investments have been made in the Indian air sector over the past several years due to India's extensive underutilised air transportation network. During the first half of this decade, particularly in 2004 and 2005, six "Low Cost" carriers began operations. Included among the significant new entrants are Air Deccan, Kingfisher, Paramount, Indigo, Spice Jet, and Go Air. Airlines started to expand their fleet in order to keep up with India's quickly rising demand for air travel.

Airbus and Boeing jets are being ordered by numerous Indian airlines. To expand their fleet, they are investing billions of dollars. Additionally, new competitors are growing their fleet. Indian Airlines currently operates a fleet of numerous aircraft in a variety of categories, including wide–bodied Airbus A300s, fly–by–wire Airbus A320s, Airbus A319s, Boeing 737s, Dornier Do–228s, and ATR–42s.

India had 288 operable airports in the 1990s. 208 of them had runways with a fixed surface. With effect from April 29, 2005, Air India has also introduced a new subsidiary airline called Air India Express. With 13 aircraft in its fleet, Air India Express currently offers 57 weekly

flights from nine Indian cities, including Amritsar, Chennai, Delhi, Kochi, Mangalore, Mumbai, Pune, and Thiruvananthapuram, to six Gulf cities, including Abu Dhabi, Dubai, Al Ain, Muscat, Salalah, and Sharjah, as well as Singapore. Air India Express has placed a B737–800W order for 181 seats. According to market share, Jet Airways, Indian, Air Sahara (now part of Jet Air), and Air Deccan are the most well–known domestic airline brands.

More than 80 cities in India are connected by these airlines. Following the liberalisation of Indian Aviation, three of these, Jet, Indian, and Sahara, also fly internationally. The ministry oversees a number of organisations, including the Directorate General of Civil Aviation, Bureau of Civil Aviation Security, Commission of Railway Safety, Indira Gandhi RashtriyaUran Academy, Air India Ltd, Indian Airlines Ltd, Pawan Hans Helicopters Ltd., and Airports Authority of India.

4.6 FUTURE TRENDS :

While trying to optimise their performance in all facets of airport operations, airports have undoubtedly faced significant hurdles as a result of the evolving airport operating environment. One of the main causes of these difficulties has been the increased competitive pressures brought on by airline deregulation and airport privatisation, as well as the rising expectations for an industry that is more sustainable, secure, and quality–conscious. How to efficiently service increasingly diversified airlines and passengers is a major concern for airports. As a result, the idea of "one size fits all" has been largely replaced at many airports by increased flexibility, adaptability, and a rising emphasis on offering facilities and services to suit the various demands of consumers. Countries are developing visitor centre with well–equipped modern communication technology.

For instance, this can entail putting a lot of effort into becoming a hub, making sure the minimum connection time (MCT) is as quick as feasible, and making sure dependable transfer facilities are available at all times. Operators may be required to group alliance members together at large international airports so that the airlines can realise cost savings in addition to brand and operational benefits (for example, at London Heathrow, BA/oneworld members are handled in Terminals 3 and 5; SkyTeam in Terminal 4; and Star Alliance in Terminal 2). Operations–wise, this could be challenging, particularly if the airport was planned with terminals for various kinds of domestic, international, and intercontinental traffic.

❑ **Check Your Progress :**

1. What the main reason are of delayed or cancelled Flights ?

   a. Weatherissues b. Maintenance issues

   c. Personnel issues d. All the above

2. OPSNET is used by _____ as its Operations Network to collect data on flight delays.

   a. Airlines b. FAA c. Airports d. NASA

3. During 1990s in India how many operable airports were there ?

   a. 88 b. 188 c. 288 d. 388

4. _____ is the primary cause of air traffic control–related flight delays.

   a. Weather b. Refuelling

   c. Passenger boarding d. baggage loading

5. Why many airlines have imposed fuel surcharges on their customers ?

   a. To get more profit b. High fuel costs

   c. High transportation charge d. High labour cost

6. _____ also permit strategic partnerships and remove the capacity constraint.

   a. Deregulation b. Open Skies

   c. Liberalisation d. Strategic alliance

7. One goal of alliances is to enable seamless service, in which passengers can get many services under single window.

   a. True b. False c. Can't say d. May be

8. The largest international market for air transportation services in 2021 was :

   a. North America b. Gulf

   c. Asia Pacific d. Europe

4.7 LET US SUM UP :

The aviation industry is a world in itself, encompassing a massive workforce and contributing a significant percentage to the global economy. The sector was set for major growth, challenges notwithstanding, until the pandemic hit, post which it plummeted to a considerable extent. Yet, it is fair to state that despite the economic impact of COVID–19 on airline industry, it has been on the road to recovery, and may very well get back to the mainstream in a few years.

Tourism demand has stimulated the rapid development of transportation. As millions of tourists expect to be transported safely, quickly and comfortably to their destinations at a reasonable cost, the transportation industryhas had to adjust to accommodate to this increased, and also sophisticated, demand.

Air transportation has been experiencing technological advancements and all helped in managing the air transport industry to become a popular and mass transportation mode. Various modes of transport are interlinked and interconnected. This interrelationship that exists among different transport forms makes transportation more accessible and easier.

Flights can be delayed or cancelled due to weather, maintenance issues, or personnel issues. This hazy mix of problems, which can range from too few crew members or a shortage of pilots to bad weather to plane shortages, plagued airlines last spring and summer as they attempted to add more flights to their schedules.

The global airline industry has entered a phase where the "Airline Death Spiral" has taken hold. As a result, there has been a worldwide wave of bankruptcies and airline closures. Furthermore, when airlines request more time or less stringent rules and regulations, regulators are not sympathetic. Aside from that, the demanding fliers and competition from low–cost airlines mean that full–service airlines can no longer compete on price or volume. Finally, increased business costs have harmed the global airline industry's profitability and viability.

4.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. d	**2.** b	**3.** c	**4.** a
5. b	**6.** b	**7.** a	**8.** c

4.9 GLOSSARY :

Carbon Foot Print : The volume of carbon dioxide emitted into the atmosphere as a result of a specific person, group, or community's activity.

Fleet : A collection of vessels operating under the same flag or engaged in the same activity.

Green Flying : Also known asgreen aviationword used to characterise industry practises that increase aircraft economy, decrease noise pollution and greenhouse gas emissions, all of which lead to a reduction in carbon emissions.

Ground Stop : An action taken by air traffic controllers to manage the flow of aircraft arriving at a specific airport.

Minimum Connecting Time (MCT) : The shortest amount of time necessary in a certain location or major city to transfer a passenger and his bags from one flight to another.

Operations Network (OPSNET) : The authorised source of information about FAA air traffic operations and delays.

TWA : Trans World Airlines was a major American airline that operated from 1930 to 2001.

Visitor Centre : Usually located at the entrance to a city/town, offers information about the area, tools for arranging trips, and other services like restrooms and Wi–Fi.

4.10 ASSIGNMENT :

1. "Roald Amundsen travelled from Svalbard to the North Pole with the airship 'Norge' in 1926, but after a century a Swedish company

named 'OceanSky' is on the verge of serving with 'Airlander 10', which would be one of the most elegant and comfortable excursions". According to you why it took so long ?

4.11 ACTIVITIES :

1. Read some of the travel magazines and collect and read the articles about current development in air transportation.

4.12 CASE STUDY :

The World's longest airship with five–star–hotel–like cabin and panoramic windows will soon fly passengers to the North Pole for $60,000

Author: SayanChakravarty, November 13, 2019

Journey to the North Pole to explore its extreme environment and barely hospitable icy landscape sounds like an arduous task which is meant only for the most seasoned adventurers. However, a Swedish company called OceanSky wants to turn it into one of the most luxurious and comfortable journeys one can imagine. Come 2023, the company will begin operating its unique tour to the North Pole onboard the world's largest aircraft called the Airlander 10. The cabin of the 92–meter–long aircraft will be furnished as a flying five–star hotel, with ultra–luxurious interior, panoramic windows and spacious personal cabins. The flight will take–off from Svalbard on the Norwegian archipelago and set–off on a unique 36–hour flight that will give its passengers an unparalleled experience. The price for a private two–bed cabin is 600,000 SEK (about $64,000) and the Swedish company has already put the tickets on sale.

Carl–Oscar Lawaczeck, CEO and founder of OceanSky said: "The expedition to the North Pole is for the traveler who wants to experience the Arctic in a unique way, and at the same time contribute to the development of sustainable travel." The overnight trip is 15 hours each way, with six hours on the ground which includes lunch in the snow. The 16 passengers will be served an Arctic–inspired menu prepared on–board by an award–winning chef. Lawaczeck further added: "Roald Amundsen flew from Svalbard and over the North Pole in 1926 with the airship 'Norge'. Now we are doing the same expedition, but we will also land on the North Pole. The passengers will enjoy the arctic nature in serenity and comfort in a hyper–efficient modern flying vehicle. They will be pioneering a new way to travel, flying for sustainable skies." After reaching the North Pole, the passengers would enjoy a day excursion, to be led by expert and climate activist Robert Swan.

The Airlander 10 is being built by Hybrid Air Vehicles at Cardington in Bedfordshire and has been under development for over the past 12 years. It is a hybrid aircraft with a helium–filled upper–section of the airship for lift along with 4 diesel–powered propellers for lateral movement and can fly continuously for days at a maximum speed of 92mph. In

November 2017, a prototype of the Airlander 10 crash–landed and collapsed during a test flight.

Questions :

1. According to you what would have come in mind to develop such type of aircraft ?
2. Will use of such types of aircraft, harm the environment ?

4.13 FURTHER READINGS :

1. International Tourism by A.K.Bhatia.
2. Air Transport Security – Issues, Challenges and National Policies by Joseph S. Szyliowicz, Luca Zamparini
3. The international airline industry: trends, issues, and challenges byNawal K Taneja
4. The Airline Industry: Trends, Challenges and StrategiesbyJohn G. Wensveen

BLOCK SUMMARY

The link between tourism–producing and destination regions is provided by the transportation sector.In the early twentieth century, flying was exotic and dangerous. The use of aeroplanes was unusual. Airlines, aircraft, airports, and air routes did not exist. KLM, the world's longest continuously operating airline, launched the first commercial service between Amsterdam and London in 1920.

Trade also includes tourism. About ?3,000 crore in foreign currency is produced in India by international tourists. More than 1.5 crore people are employed directly in the tourism sector. Almost all WTO members value tourism, especially in terms of employment, GDP, and the creation of foreign cash. It encourages national unity while simultaneously fostering regional handicrafts and cultural pursuits.

India continues to have the world's fastest–growing aviation market. As a result, both airlines and aircraft manufacturers are eager to enter the Indian market. Some experts expect that India is in a special position to have a significant comeback when the aviation industry begins to emerge from the current depression.Both Airbus and Boeing are vying for the Indian market, which is expected to purchase up to 2000 aircraft over the next two decades. With its A320, which is the most popular aircraft in India, Airbus has achieved success, while Boeing has controlled the more niche but rapidly expanding widebody sector. Additionally, airlines are attempting to grow their business.

In an effort to corner the long–haul market, Vistara just became India's first private airline to operate a widebody aircraft. The government is selling every single share it owns in the airline Air India as part of the privatisation process. Foreign airlines are presently filling the void

left by Jet Airways' demise last year for a new long–haul carrier.As more people begin to fly and Indian airlines continue to thrive, the Indian market will continue to expand in the future years. Air travel generates million new jobs annually, making it an important global employer. This includes both professions created by aerospace manufacturers and positions held by those working in the aviation industry, such as those in airline and airport operations, aircraft repair, air traffic management, head

BLOCK ASSIGNMENT

1. Discuss the history of different types of aircraft.
2. How did the Aviation developed as an Industry ?
3. "Tourism is a Trade". Justify the statement.
4. What is the role of LCCs in congestion and delay ?
5. What were the impact put by World War on International Air movement ?
6. What role does transportation play in tourism industry ?
7. What is the role of airlines in growth and development of Tourism Industry ?
8. What challenges do aviation industry face ?
9. What would be the future of Air transportation ?

❖ **Enrolment No. :** ☐

1. How many hours did you need for studying the units ?

Unit No.	1	2	3	4
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	☐	☐	☐	☐	_____
Language and Style	☐	☐	☐	☐	_____
Illustration used (Diagram, tables etc)	☐	☐	☐	☐	_____
Conceptual Clarity	☐	☐	☐	☐	_____
Check your progress Quest	☐	☐	☐	☐	_____
Feed back to CYP Question	☐	☐	☐	☐	_____

3. Any other Comments

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AIR TRANSPORTATION & DISASTER MANAGEMENT

DR. BABASAHEB AMBEDKAR OPEN UNIVERSITY
AHMEDABAD

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

AIR TRANSPORTATION & DISASTER MANAGEMENT

Contents

Dr. Babasaheb Ambedkar Open University Ahmedabad

BBAATR-302

Air Transportation & Disaster Management

BLOCK 2 : AIRLINES TRANSPORTATION SYSTEM

AIRLINES TRANSPORTATION SYSTEM

Block Introduction :

Flying is the way of transportation that the majority of rational travellers choose since it is quicker and safer than other options. Today, a wide range of services are provided due to the large number of scheduled and charter flights.

The International Civil Aviation Organization (ICAO) divides civil aviation activity into two categories: scheduled and unscheduled operations. Services that are not scheduled include charter, air taxi, commercial business aviation, etc. Charter airlines can be said to have originated in Europe.

The aviation sector is responsible for producing and running all sorts of aircraft. In this block, we'll focus on the industry's operational side.

Air travel is not just a sizable industry in and of itself, but it also makes a sizable contribution to broader economic, political, and social activities. Similar to other forms of transportation, the demand for its services is driven by the desires and needs to fulfil some other, overarching objective. Air travel, for example, can support the economic growth of a region or sector, but there must first be a latent market for the products and services that region or business has to offer.

In many countries around the world, the tourism industry is growing, which promotes both economic growth and the creation of new jobs. The industry of tourism, which is regarded as a stimulant, also feeds the economy. One of the biggest industries in the world, travel and tourism is expanding significantly. Bright futures, new travel locations, new tourist demographics, and developing tourism specialisations all point to the growth of this industry. The tourism industry is also a result of travel and stays outside of people's normal environs.

Block Objectives :

After understanding this block learners will have knowledge and its objectives is :

- To provide the learner with a knowledge about scheduled and non–scheduled air services and it's scheduling.
- To provide information about history and development of air transportation in India
- To provide information about Air transportation in major parts of world.
- To make learner understand about needs of international air transport.
- To provide information about objectives, needs, significance and limitations of policy and regulations in Air transport.
- To understand the importance and developments of Air transportation in economic and environmental aspects.

Block Structure :

Unit 1 : Scheduled and Non–Scheduled Airlines Services

Unit 2 : Air Transportation in India

Unit 3 : Air Transportation in Major Parts of World

Unit 4 : Regulations in Air Transportation

UNIT 01 *Scheduled and Non–Scheduled Airlines Services*

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- To provide the learner with information about scheduled and non–scheduled air services
- To make learner aware about the scheduling of airlines

1.1 INTRODUCTION :

Most sensible travellers choose flying since it is faster and safer than other modes of transportation. Because there are so many scheduled and charter flights today, there are a lot of services offered. A flight schedule offers a useful roadmap for deciding which places to go when. Creating a flight schedule that makes the most use of an airline's resources is a challenge in airline schedule planning. Schedule planning is typically a sequential procedure. With the growth of air travel, there is a greater demand for many services. When a flight is scheduled, the airline sells individual seats to passengers until the plane is completely packed.Flights are regularly offered by a scheduled service operator, whether on hourly, daily, or monthly schedules. Both the routing and the departure timings are set. The flight information is pretty static and typical.

Air Transportation subsector industries provide air transportation for passengers and/or goods utilising aircraft such as aeroplanes and helicopters. The subsector differentiates between scheduled and unscheduled air transportation. Scheduled air carriers operate even when flights are only partially filled and fly regular routes on regular timetables. Non–scheduled carriers frequently operate during off–peak hours at congested airports. These businesses have more freedom in terms of airport selection, operating hours, load factors, and other operational factors. Non–scheduled carriers

offer charter flights for passengers, cargo, or specialist aviation services. General–purpose aircraft are used by specialty flying services firms to provide a variety of specialist flying services.

A scheduled flight and a charter flight are very different. A charter flight does not adhere to the air carrier's timetable. The customer decides the schedule based on their requirements. In essence, a charter is when a person or business rents out the entire aircraft for a very specific reason. The hirer and the aircraft firm have a specific agreement that determines the departure hours and final locations.

Scheduled airlines operate on established schedules. Airlines that are chartered or unscheduled only fly when there is a demand, typically during the tourist seasons. Because they are only run when there is a high load factor, chartered flights end up being less expensive than those operated by scheduled carriers. Charter flights provide more affordable travel packages to places like Portugal and Spain.More than 400 charter aircraft land in India each year, mostly in Goa. The peak period for chartered flights into Goa is from December through January.

Flights that are scheduled receive approval from the aviation government for their timetable months in advance. Charter flights that are run as needed are considered non–scheduled flights.

1.2 SCHEDULED AND NON–SCHEDULED AIR SERVICES :

The 1944 Chicago Convention governs both planned and unscheduled international air services. Although the Chicago system has come under fire for not keeping up with the demands of the world economy, it has remained in place to this day; as a result, international air services are still governed in the same way they were over a century ago. In order to comprehend the definition of "non–scheduled services" as stated in Article–5 of the Chicago Convention, the definition of "scheduled services" must first be explained. Scheduled air services are defined in Article–6 and are as follows: No regularly scheduled international aviation service may be operated over or into the territory of a contracting State without that State's prior special consent or other authorization, and only in conformity with the provisions of that State.

Scheduled air service is a series of flights carried out by aircraft that meet all of the criteria for the carriage of people, cargo, or mail.It is operated to serve traffic between the same two or more airports, either according to a published timetable or with flights that are so frequent or regular that they form a clearly systematic series. On each flight, seats and/or capacity to transport cargo and/or mail are available for individual purchase by the general public (either directly from the air carrier or from its authorised agents).

All scheduled international air services (that either pass through the airspace of more than one state, carry passengers, mail, or cargo, or service two or more destinations in accordance with a published timetable) are

required by the Chicago Convention of 1944 to obtain prior authorization before flying into or over foreign territories. Most nations, including Australia, Britain, and the US, signed the International Air Services Transit (Two Freedoms) Agreement to close the gap in regularly scheduled international air services (Transit Agreement). When it comes to streamlining overflight rights, this agreement has proven to be very beneficial. It has also proven to be useful in situations where diplomatic issues develop between contracting parties. Although the Transit Agreement gives ICAO the authority to settle disputes, this authority is rarely used in practise.

In the use of a runway, Priority could be granted to various airline kinds under a revised administrative structure as opposed to upholding the grandfather rights principle. Long–haul flights that often have less schedule flexibility or those without a surface access option, for instance, could be given precedence. As an alternative, airlines flying larger aircraft or flights with lower noise or emissions impacts could be selected. Scheduled flights may be given preference over charter flights, passenger flights may be given preference over cargo flights, or new entrants may be given more chances to secure slots. Another choice might be to limit frequency usage to a specific location when a predetermined threshold has been achieved.

There are currently international air services in existence that do not adhere to the requirements of Article 6, even though scheduled international air services continue to be the most significant part of international air travel (from a commercial standpoint). The flexibility provided by Article 5 has been praised for allowing international air travel to be customised to the demands of the expanding travelling public, in contrast to the restrictive character of Article 6.

Non–scheduledair–services can be Charter flights and are unscheduled air transportation of people for pay using a kind of aircraft certified for carrying more than ten people or for carrying cargo using a plane whose maximum allowed take–off mass is greater than 5,700 kg.Serial flights are more than four charter flights to the same location in a two–month period.Non–scheduled or charter air services are governed independently from scheduled international air services by a Non–scheduled Air Services Agreement or a Charter Agreement. Although less formal than a formal agreement, a memorandum of understanding (MOU) can still be just as legally enforceable and can apply to any or both types of international aviation services.

A commercial air transport service that is provided in a manner other than a scheduled air service is known as a non–scheduled air service. A non–scheduled activity using a chartered aircraft is referred to as a charter flight. However, not all commercial non–scheduled operations are charter flights, despite the fact that the phrases non–scheduled and charter (i.e., a legal agreement between an air carrier and a party hiring or leasing its aircraft) have come to be used interchangeably.

Non–scheduled air services first became a significant type of air transportation in Europe, eventually expanding to North America and other areas. In the 1960s and 1970s, they developed quickly thanks to the rising need for inexpensive air travel.

European–born charter airlines provide a certain brand of service. Demand determines how charter airlines function. They frequently operate from minor or regional airports that are less expensive and busy and are not otherwise served by scheduled flights. In–flight meals, entertainment, and free checked baggage are all possible perks of the service.

Only inclusive tours may include seats on charter flights, and the charterer may buy the whole flight's seat inventory and commit to filling it for a predetermined fee. Tour operators and special interest organisations are drawn to this business model, however charter flights' revenue is very cyclical and depends on "summer sun" tourists and "winter ski and sun" traffic. During leaner season, charter airlines may rent their aircraft to foreign operators.

Although non–scheduled services are frequently seen by States as an addition to scheduled services, they have played a significant role in some regions–most notably Europe–in the growth of international mass tourism, which has grown to be of significant economic and social significance for many developed and developing nations.

Non–scheduled international air services are often approved on the basis of national legislation, in contrast to scheduled international air services, which are usually governed by bilateral agreements between States. However, these are outside the purview of this chapter and this manual. Aviation regulators also occasionally regulate commercial non–transport operations (such as aerial crop dusting and surveying) as well as operations like overflight and landing by private, corporate, military, and State aircraft, whether or not for transport.

All types of air carriers may offer non–scheduled air services, however they can be separated from them from scheduled services by the following features. They are usually run as follows :

- ✓ Inaccordance with a contract for chartering an aircraft on a point–to–point, frequently plane–load basis (although many charterers may split an aircraft's capacity);
- ✓ They are exempt from any public service requirements that might be imposed on regularly scheduled air carriers, such as the need to run flights in accordance with a schedule regardless of load factor;
- ✓ with greater operational flexibility than scheduled services in terms of airport options, operating hours, and other operational and service requirements;
- ✓ without the air carrier maintaining direct control over retail prices (the aircraft capacity is typically sold wholesale by the carrier to tour operators, freight forwarders, or other entities); subject to

obtaining permission or giving prior notice for each flight or series of flights to/from the country of origin or destination or both; and without the charterer taking financial responsibility for underutilised payload.

1.3 FLIGHT SCHEDULING :

All other airline planning and operations begin with flight scheduling. The flight schedule is a timeline that details which places should be flown to and when. The decision of an airline to offer a particular flight will mostly be based on market demand projections, available aircraft operating characteristics, available manpower, rules, and competitor airline conduct. An airline's network size is often expressed and quantified by the number of airports it serves and the frequency of its flights. The flight–scheduling team and route planning may have more than 30 personnel at large airlines.A flight schedule provides a practical plan for deciding which places to go and when. The challenge of airline schedule planning is developing a flight schedule that makes the best use of an airline's resources.

The route system is where the schedule construction process starts. The route system for the airline is determined by the cities in the network. A carrier's route network determines how profitable it is to operate. The route systems of an airline are connected to all the short– and long–term costs ascribed to the fleet, avionics, labour agreements, and operations.

This schedule's creation involves the marketing division significantly. Prior to the 1978 Airline Deregulation Act, airlines were obligated to follow the Civil Aeronautics Board's (CAB) recommended flight paths, regardless of customer demand! The majority of airlines prioritised lengthy point–to–point flights during this time. Airlines now have the option to decide which markets to service and how frequently they should be served thanks to deregulation.

Normally, schedule planning is a sequential process. Important considerations must initially be made on the flight schedule in order to match the airline's fleet to the flights in the schedule. After making all of these decisions, crew planning is finished. These problems are dealt with progressively rather than simultaneously due to technology and solution algorithm limitations. Since simultaneous solution approaches have the potential to offer less expensive solutions and may not lead to the incompatibilities that sequential solution approaches do, they are obviously preferred.

Demand projection for consumers is intrinsically difficult. The flight schedules of airlines are released one season in advance. Forecast mistakes may be included in medium– or long–term demand projections, which are typically utilised for route planning and fleet management.

It's critical to project travel demand for each sector. In order to balance the availability of the operator's aircraft capacity with the creation

of a timetable that appeals to potential passengers, flight schedule generation is used. The reason for a passenger's trip might affect their preference for flights, which in turn affects the demand for a certain industry as well as service and product features and associated customer expectations.For domestic travel, business travellers typically leave early in the morning and return in the evening, whereas pleasure travellers are more flexible about departure hours and frequently look for cheaper tickets. As a result, airlines frequently offer more flights during business travellers' preferred travel times and charge more for such flights. These flights often leave during the busiest times of the day–morning and evening. In contrast, flights booked during off–season frequently cost less and draw more leisure or less–hurried passengers.

❑ **Check Your Progress :**

1. Which of the following faces uncertainty of demand as compared to other ?

   a. Scheduled Flights b. Non–scheduled

   c. Charter d. On demand Taxi

2. Charterair service was first introduced in which of the following areas ?

   a. North America b. India

   c. Europe d. Australia

3. In which Article of Chicago convention "Scheduled air services"have been defined ?

   a. Article–3 b. Article–4 c. Article–5 d. Article–6

4. Which of the following has more flexible service ?

   a. Scheduled Airlines b. Non–scheduled Airlines

   c. Both d. Noneof these

5. Prior to the Airline Deregulation Act, airlines were obligated to follow which of the following body for flight path ?

   a. ICAO b. WTO c. CAB d. FAA

6. A _____ provides a practical plan for deciding which places to go and when.

   a. Flight schedule b. OAG

   c. Departure list d. None of the above

7. Non–scheduled air–services are not allowed to carry cargo.

   a. True b. False c. May be d. Can't say

8. According to which international Convention,flight are required to obtain prior authorization before flying into or over foreign territories.

   a. Paris Convention 1919 b. Warsaw Convention 1929

   c. Chicago convention 1944 d. Montreal Convention 1999

1.4 LET US SUM UP :

A flight schedule outlines a workable strategy for choosing which destinations to visit and when. Creating a flight schedule that makes the most use of an airline's resources is the challenge of airline schedule planning. Schedule planning is typically a sequential procedure.The expansion of air travel globally has increased demand for a number of services. Travellers today have several options when it comes to flying, including the option of renting a plane that is especially suited to their needs.Scheduled and non–scheduled aviation services are both provided by airline firms. Because it is implied from the nomenclature that what sets these air services apart is their reliability.

Compared to charter flights, which more likely have a precise understanding of passenger demand, scheduled airlines typically experience uncertain demand.

1.5 ANSWERS FOR CHECK YOUR PROGRESS :

1. a	**2.** c	**3.** d	**4.** a
5. c	**6.** a	**7.** b	**8.** c

1.6 GLOSSARY :

Air Taxi : A small commercial aircraft that is flown for short trips between places that are not serviced by regular airlines.

Demand Projecting : A method used to predict future demand for a product or service.

Inclusive Tour : A journey by flight that has been planned by a tour operator and includes other transportation and hotel arrangements.

Official Airline Guide (OAG) : Originally a publication, is now an electronic listing of all scheduled airline flights.

Off–Season : A period of inactivity or diminished activity

1.7 ASSIGNMENT :

1. What was the reasons of evolution of Chartered planes ? How it is harmful to environment.

1.8 ACTIVITIES :

1. Find out the companies which provide charter services.

1.9 CASE STUDY : :

Jet Airways Case Study: 'Come Fly With Me' To 'Flying Without Wings' By CIDM Digital Marketing

Due to COVID–19 pandemic, the hospitality and aviation industry suffered a major blowout. The domestic and international travels were restricted globally, and there is no chance that their suffering (read the lack of revenues) will go away in the immediate future. With countries

banning international travellers and having a 14–day quarantine policy in place for the visitors, the tourism industry and along with that the airlines have to call it a pack–up for a few months. And in this realm, a few months– is all you have. This case study is showing many aspects of success and failure of jet airways is a very informative way. Just Like the big Indian Tycoons Zomato, Paytm, and oyo rooms, the Jet was a major Indian Airways.

The Case study About Jet – Its a Challenging Phase

The recent example of it would be Maldives or Dubai. Dubai, one of the favourite shopping destinations, is at the verge of collapse in just two months–because its major hotels had to shut down due to lack of travellers. Imagine what the pandemic has done to a city like Dubai, what it would do the aviation industry that is already struggling to reduce overhead costs and breakeven ?

Jet Airways was indeed called off long before the COVID–19 but being an Indian airline player never is easy. Be it the legacy carrier like Jet or Air India, or LCC like SpiceJet or Indigo– the country happens to be one of the most robust markets to survive where the customers have to be lured by the discounts. It is home to the fastest–growing middle–class segment that believes in clinching money by the teeth. Airlines, here, bring down the ticket price to ? 1 to attract the volume and just to see through another fiscal quarter. Apart from Jet, Indian Tycoon Vijay Mallya's luxury airline Kingfisher Airlines was grounded in the year 2012 for its inability to pay debts and the lack of operating expenses.

The advent of budget, for the lack of a better and more appropriate word, cattle–class airlines SpiceJet and IndiGo, several airlines had to follow suit. They cut their prices on tickets while they were operating a better fleet of airlines including the Boeings, offering food on the flight and were led by a more experienced team. No wonder, Jet had a most significant market share of 22.6 per cent in 2010 but had to experience a setback and forced to take a second place after IndiGo. Jet reported a reduced passenger market share of 17.8 per cent in 2017.

The Jet Airways was a success of Failure

So, what went wrong ?

It wasn't a crash when the engine makes weird spurting noises, and you don't know what to do. Jet Airways' failure was one of those atrocious but imminent realisations when a pilot sitting the cockpit knows that the weather is terrible, and there is heavy turbulence. After a few moments, they could see the land, albeit in a steep dive. Though it had a good run while it lasted and if there is any solace, it was the front runner of India's air travel market and one of the most popular airlines in India throughout for its exceptional services.

Before we begin with how things went awry for Jet and Mr Goyal, let's have a look at the dream run of Jet Airways. It is critical to understand

because we are talking about a company that was 'Vocal for Local' long before it became a symbol of pride to tout Indian roots for a brand. It took the Indian aviation industry and transformed it. Before Jet, it was state–run and state–controlled Air India that didn't give you any reason to write home about. Be it service or punctuality–Jet revolutionised the aviation sector and how!

The Marketing Mix Case Study of Jet Airways

Jet Airways'4 'P's of Marketing were in line with its vision of being heralded as a full–service airline. Its portfolio had products including

A fleet of 117 aircrafts comprising Boeing 737, and ATR 72–500

Intangible products including mobile check–in for guests, a 24/7 customer care accessible via internet or mobile

Exclusive airport lounges for 'Jet Privilege' (Later, InterMiles) customers

Services for people with newborn kids, babies, expectant mothers, people with special abilities or medical issues

The first–class seating had in–bed extra–wide room, personal television, closing cabin door, private wardrobe and exceptional food and beverage services. Economy class was a toned–down version of business–class privileges.

It offered concessional prices and special offer for students, senior citizens and armed forces veterans to induct and normaliseair travel in the middle–class segment.

It had banked on Influencer Marketing even when digital marketing wasn't a norm. With the leading Indian movie actor Shahrukh Khan as its brand ambassador, it reached out to each segment of the demographics while maintaining its luxury appeal.

The airline, however, relied on OOH advertising to convey its USPs. Following its U.S. based counterparts; the Jet Airways removed a row in its Boeing 737–800 aircraft to facilitate comfortable seating for its customers. It used a 3D billboard to sell its idea and effectively communicate the concept to the target audience.

Social Media Mix of Jet Airways

Jet Airways had Twitter, Flickr (Old–age Instagram), YouTube and Facebook page that was used by customers

The SWOT Analysis Case study for Jet Airways

Now, when Jet Airways is officially written off the market, it becomes easy to extrapolate safelyits strategy and the conditions that led to its fall.

Strength :

- ✓ Only private airline with operations on international routes
- ✓ High credibility and substantial brand value in the market

- ✓ Recognised for its quality and punctual services
- ✓ Extending fleet size to accommodate new demands

Weakness :

- ✓ Underwhelming domestic market share
- ✓ The sudden transition to grab domestic market share when faced competition from low–cost carriers
- ✓ High prices for economy class
- ✓ Not responding to the challenges of low–cost airlines in time
- ✓ Failing to understand Indian consumers' mindset

Opportunities :

- ✓ Domestic market
- ✓ Long haul flights
- ✓ Bankable and usefulmodern technology
- ✓ Comfortable and spacious plane seats

Threats :

- ✓ Saturation in tourism
- ✓ Reduced fair but not considerably enough for middle–class
- ✓ Increasing wages, operational and overhead costs to maintain a fleet
- ✓ Competition from international carriers

History – The Takeoff of Jet Airways

The airline was founded by Mr NareshGoyal on April 1, 1992. It commenced its first flight on May 5, 1993, and until its last trip on April 17, 2019 –the sky was the limit.

Jet airways always had Boeing 737 in its fleet. The Boeings are easy to maintain and manoeuvre. They are fuel–efficient too. This is why the airline was able to rule the Indian sky in such a short span. The daily number of flights operating was higher. The operations were leaner and entirely seamless. While Indian Airlines had almost 400 employees for an aircraft, Jet was doing with only 160. The flight crew training was considerably more straightforward. Still, the inspiration for providing avant–garde services to its customers that Air India couldn't offer came from abroad where customer service is taken rather seriously.

When it commenced its operations, it was the only carrier in the private sector. There was no Vistara, Sahara, SpiceJet or IndiGo to challenge its monopoly. There couldn't be a better time to be up in the air.

Jet Airways was a Successful venture in India

While making jet airways case study, its found that: It received its scheduled airline status on January 14, 1995. By 1996–1997, it had grabbed the second–highest share of twenty per cent following closely

after the government–owned Indian Airlines. It had made a record of flying more than 2.3 million passengers in two years. Its fleet included for Boeing 737–400 and six Boeing 737–800 aircrafts worth $375 million.

It was the first Southeast Asian airline to boast of a 737–800 in its fleet. Within a short span of five years of its commencement, it was flying twelve Boeing 737 aircraft to twenty–three domestic destinations daily for more than eighty–three times!

In the year 1997, The Cabinet Committee on Foreign Investment or CCFI reversed its decision of allowing foreign carriers to take a maximum forty per cent equity stake. Following which, Goyal took the control back in his hands from Jet's foreign investors. It was announced in 1999 at the Paris Air Show that the airlines would include a fleet of ten Boeing 737–800 aircraft worth $550 million. Soon, in 2001, it became the first buyer of Boeing 737–400 simulator and the leading Indian carrier to operate more than 195 flights to 37 Indian destinations. The case study about jet Airways shows its a successful venture.

However, the Indian aviation industry soon experienced a paradigm shift. The airline travel, which was considered to be a privilege of the upper–middle–class and high–class segment, was now finally within reach of the middle class. People who would travel in a local train or a bus could eventually make their dream of flying in an aeroplane a reality. Enter SpiceJet and Indigo, with their congested aircraft, seating for three with barely any leg space and sorry, no food on–the–go. If you want a better seat or have trouble with space or want an aisle seat, you need to shell out extra money that isn't included in the ticket.

When did Jet Faces its first Loss ?

It shouldn't come as a surprise that after these two budget airlines commenced their operations, Jet faced losses for the first time that very few knew was going to be a trend for the airline and eventually turned to be a bleeding asset in the years to come. In 2002, the airline's deal for ten aircraft at Farnborough air show worth $520 billion fell through for lack of money. It became evident that once the leading player in the Indian aviation industry couldn't keep up its ambition, for, it failed to read the pulse of India's fastest–growing segment.

Next year, in 2003, the Government of India allowed the private carriers to launch international operations in South Asia and Jet Airways, geared up for its maiden international flight from Chennai to Colombo in 2004.

The very same year saw Jet becoming a public company and get listed on the Bombay Stock Exchange. Government of India also allowed Indian airline companies to operate all over the world except the Middle East. Jet Airways was also granted authority to enforce its services to Heathrow Airport in London enabling the airline to take off its first 'truly' international flight, a long–haul, subleased, two classes Airbus A340–300s.

Following the Government of India's extension on foreign ownership limit to forty–nine per cent, Etihad bought a forty–nine per cent stake in Jet. In contrast, Goyal retained fifty–one per cent of it saving it from falling when it was cash–strapped. Jet also launched an IPO in 2005 and raised some interest leading to institutional, retail and non–institutional oversubscription. It raised approximately INR 19 billion, making the founder, NareshGoyal, a billionaire on paper.

JetLite Airways by Jet

In 2006, the Jet Airways wanted to acquire another cash–starved airline Air Sahara in a cash deal worth US$500 million, but the deal didn't go through. However, the deal was successful for US$200 in 2007, and Air Sahara was rechristened as JetLite to proposition the middle–class segment, the new–age cash–conscious customers of India. JetLite was a wholly–owned subsidiary of Jet Airways and a full–service aircraft line. The case study about jet Airways shows that It was good move taken by Jet.

The airline collaborated with Kingfisher Airlines for Frequent–Flyer Program, sharing of the crew and ground–handling equipment and along with code–sharing for flights. It also launched Jet Konnect, another low–cost brand of ATR 72 and Boeing 737 to operate on profitable routes and with a higher load of passengers in 2008.

Despite its acquisitions and efforts to stay afloat, it was clear that Jet Airways had trouble sustaining as a profitable model. It laid off 1,900 employees, who were reinstated after theMinistry of Civil Aviation, India intervened.

Even though it went on to become the largest airline in India with more than twenty–two per cent share in the financial year of 2009–2010, it also became the first domestic airline in India to stop serving meat products during flight and liquids in the check–in luggage.

When Did Jet Airways saw a Dark phase of its Life ?

The bankruptcy of Kingfisher airlines led Jet management to merge JetLite and Jet Konnect– and eventually offering a business–class–like seating arrangement in domestic flights too.

While making the case study its found that, the end of 2013, however, brought the airline to face the fight of survival. It entered into the market of a price war with IndiGo and SpiceJet. It didn't stop Jet airways' stock from falling or its reputation in the market. By 2013, it was able to post some profits after reporting a loss for two years.

In its bid to outrun the low–cost carriers and growing competition, it phased out Jet Konnect in 2014, merged it with Jet Airways ultimately and re–positioned it in the market as a full–service airline in the same space with Vistara and Air India. Simultaneously, it closed its hub at Brussels Airport and replaced it witha new one at Amsterdam Airport in 2016.

Many experts believe that Jet Airways crumbled under the pressure of its expansion plan. It kept on expanding its fleet of Boeing and depleting its cash reserve eventually. There wasn't anything wrong with global aspirations or on international routes, but it forgot to keep the sustainability of its operation and competition into account. High operating costs and the inability to cope with the demand for low fares made the lessors from Dublin, Spain and Dubai anxious and left the management with no option to bounce back in the fold.

When Did Jet Faces a Dramatic Crisis ?

The dramatic crisis, be it the laying off its employees, the crude oil prices and the falling value of rupee added fuel to the fire. Out of its life of twenty–six years of establishment and ten years of operation, it posted a loss for eight years. While it expanded its operation on 600 domestic and 380 international routes– it went on to ground more than fifty aircraft.

The incidents like the pilot forgetting to optimise aircraft cabin pressure went viral and caused an irreparable dent in the reputation of the airlines. The case study about jet airways is full of knowledge about how a company moves to the top and sudden fall down because of its actions.

Finally, the imminent happened. The airline had to cease operation due to incurring losses in 2017. The majority of its fleet was grounded for non–payment asitfailed to abide by the lease agreements. Amidst the reports of the airline "trying" to retain some liquidity, the founder Mr NareshGoyal and his wife AnithaGoyal resigned from their posts of Board of Directors. India's largest multinational company Tata Group initially wanted to buy stakes and redeem the airline. Still, it retracted its step once Mr Goyal refused to step off from his position in the board.

Jet Airways Case Study has shown its non payment to the partner companies.

Meanwhile, the Indian Oil Corporation stopped providing oil to the airline for non–payment. In April 2018, the lenders rejected the plea of releasing emergency funding of ? 4 billion and it had to cease its operation. Its membership with IATA was suspended too. Its partners Hinduja Group and Etihad Airways also showed reluctance to buy it off and save the damsel in distress once again.

The Government of India also intervened and asked the nationalised banks Punjab National Bank and State Bank of India and National Investment and Infrastructure Fund (NIIF) to buy a third of the stake in the airline. Finding an investor was the last hope to keep it viable until a new buyer is located or, is available. However, it all failed.

The creditors seized aircraft due to non–payment, and only seven remained operational. And this is when Jet Airways surrendered and filed for bankruptcy.

The fall and fall of Jet Airways

The Aviation Industry termed Jet's failure as a 'wake–up' call. SpiceJet leased out thirty Jet Airways planes to expand its operations. Chief Ajay Singh felt the untimely collapse of an iconic brand like Jet was 'very sad' and that the policymakers' callous attitude towards industry needed to be changed.

Apart from high costs, internal clashes and failing to take timely decision to revive its businesswereamong the many reasons behind Jet Airways' failure. At times, when Indian customers would take a 36–hour train and not buy a ticket on a 2–hour plane, it didn't realise it is the money that matters for them and not the time or high–density seating with no space for legs.

Many good things found during the making of jet Airways case study. They don't care for the extra or hidden cost for something as essential as food or pay–for–your–luggage tags. The Jet Airways, which was once the favourite carrier of the middle–class segment, was left for LCC, which was growing at twice the pace vis–à–vis Europe or North America.

Besides, the management's decision to buythe ageing fleet of Sahara Airlines didn't fit and was proved to be a fatal decision for the company. With IndiGo and SpiceJet chipping away in its domestic share, it tried to switch places and to react to the competitive strategy of these low–cost carriers. But it failed to realise that the fleets of IndiGo, GoAir or SpiceJet are designed for low price whereas Jet had always been envisioned as a full–flight service with excellent service.

The consistency in brand value was gone, and it was substituted by the reaction to the market share. It left the customers confused and leaving the Jet's customer base for good. It added aircrafts right, left and centre to its fleet without understanding that the expansion not onlyextending the fleet but the customers also. It let go of the maintenance and lower economy strata that its competitors were catering to.

The Case Study about Jet Airways shows that it was Upper Class Airways

At a time, when even a migrant labourer could afford an Indigo ticket to get back to its home in the same price of a train ticket, Jet was still out of its reach. But the double whammy for Jet was its upper–middle–class, and high–class customers were deserting it too for better and prompt services of its customers. Resultantly, Jet had a rapid drop in domestic share market, but by the time it realised its folly and tried to get back to its original proposition, it was a day late and a dollar short.

Jet Airways' rise and fall are phenomenal for several reasons. Its founder, NareshGoyal, was the ideal of many entrepreneurs out there. From earning a meagre income of ? 300 as a cashier to wake up to finding

himself the Forbes' 16th richest Indian person is sure a meteoric rise and inspirational.

Jet was the future. Or it was believed so. It was a private airline in the Indian skies among the bureaucratic policies and government–run behemoth airlines. Bold enough to chase its dreams. It gave Indian consumers an option to choose from, and it did deliver on those expectations for as long as it lasted.

Though, it failed to reinvent and realigned its marketing strategy. After a decade of operations, it was unable to catch on with the young 'uns of aviation industry that might be thriving on "churnalism" but delivering nonetheless despite the similar variables such as fuel prices, competition and value of Indian rupee at play.

Questions :

1. Discuss the marketing mix of Jet Airways ?
2. Why Jet Airways failed ? Is it because of mis-match in targeting right segment or wrongly positioning the product in the minds of customers ?
3. Suggest the improvement in marketing plan of Jet Airways.

1.10 FURTHER READINGS :

1. Airline Operations A Practical Guide Edited By Peter J. Bruce, Yi Gao, John M. C. King
2. Air Transport and Tourism: Interrelationship, Operations and Strategies by M.R. Dileep and AjeshKurien
3. MANUAL ON THE REGULATION OF INTERNATIONAL AIR TRANSPORT (Doc 9626)(Third Edition –2016)
4. Airline Operations and Scheduling by Massoud Bazargan

UNIT 02 *Air Transportation in India*

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES :

- To provide the learner with informationabout history and development of air transportation in India
- To provide the learner with informationabout major airlines in India.

2.1 INTRODUCTION :

The manufacturing and operation of all types of aircraft are done in the aviation industry. We will concentrate on the operating side of the industry in this chapter. The Indian aviation market is expected to overtake the United States as the third–largest aviation market by 2024, according to the International Air Transport Association (IATA).

Everybody has a desire to fly at least once in their lifetime, and two–thirds of Indians have fulfilled this desire. According to the International Air Transport Association, India is well known for its civil and military aviation sectors.

We have already studied how aviation industry came into existence in our country. Beginning its Voyage on early 20th century, when it travelled 9.7 kilometres from Jumna River to Nainin before becoming into the world's burgeoning aviation business. By 2024, Epiphany, India's aviation industry is expected to rank third in the globe in terms of aviation markets.In the past, only wealthy individuals could buy an aircraft ticket, and the Indian aviation industry did not experience significant growth.

We are here and will eventually become the aviation market with the quickest growth, currently owning 128 operating airports.

Along with Spicejet, Vistara, AirAsia India, and Air India, IndiGo is at the top of the list when it comes to aviation dominance. Additionally, these six aviation networks serve as a critical link between roughly 80 Indian cities and the growth of the country's aviation industry. However, we could always count on Indian Military Aviation to play a significant role.

The Indian Air Force (IAF), Wings of the Army (WAF), and the Navy are the three essential components of Indian military aviation, with the IAF being the fourth–largest air force in the world. Additionally, it is said that the military aviation sector is planning to conduct aerospace research to examine the hardware and software associated with aircraft models.Military airlines like the Indian Air Force (IAF) and commercial airlines like IndiGo make up the Indian aviation industry. While government–owned airlines like Air India, Alliance Air, and IAF have helped save lives by transporting medical supplies during this COVID crisis, the civil airlines have suffered a terrible loss that is projected to total ?210 billion in FY 2020–21.The Center permitted a 30% increase in plane ticket prices to make up for the loss, but this simply made things worse. Domestic flight volume decreased by more than 70% between April and October 2020, while international flight volume decreased by 77%. In the first half of 2020, IndiGo and SpiceJet reported losing ?31 crore per day.

One of the major industries that suffered as a result of the COVID crisis around the world, where many nations are still refusing to withdraw their travel bans, was the Indian aviation industry. Additionally, this loss would have a significant impact on the GDP of the nation because the aviation sector contributes $72 billion to India's GDP. By 2022 or 2023, the Indian aviation industry is expected to recover to its pre–pandemic level.

2.2 HISTORY OF AIRLINES IN INDIA :

India is the world's fastest–growing aviation market and the third–largest overall, after the US and China. With its origins in the 1930s, Air India and state control have a long and intertwined relationship with Indian aviation.

Tata Air Services, the nation's first airline, launched Indian aviation in 1932. After being awarded a contract with Imperial Airways, J.R.D. Tata formed the airline, which initially operated as an airmail service within India. The airline's first flight, from Karachi to Mumbai, took place in October 1932.

The modest freight airline evolved into a full–service passenger carrier. By 1938, the company had changed its name to Tata Airlines and was operating domestic flights to several locations. As the first

licenced pilot in India, J.R.D. Tata was personally very involved in the airline and flew its debut flight in 1932. Tata Airways participated in the Second World War by transporting British troops and supplies.

Tata Airways was renamed Air India in 1947, the year India attained independence, and the government acquired a 49 percent interest in the airline. The next year, the airline launched its first international routes, using a Lockheed Constellation to fly from Mumbai to London.

By the 1950s, India was home to several minor airlines that ran their operations throughout the nation. Some well–known airlines included Kolkata–based Kalinga Airlines and Hyderabad–based Deccan Airways. The national carrier, Air India, continues to operate on numerous domestic and foreign routes.

The Indian government took over all of the major airlines when it nationalised the aviation sector in 1953. As a result, two government–run airlines were formed from the merger of the eight major airlines. Indian Airlines and Air India were these two airlines.

For efficiency, the two government airlines were condensed. While Air India focused on international routes, Indian Airlines flew within India. Because of the tremendous operational efficiency that resulted, the government was able to oversee these airlines.

The brand–new airline, Air India International, was India's national carrier and swiftly rose to prominence on the world market. J.R.D. Tata, who continued to serve as Chairman of the airline after its privatisation, helped Air India establish a reputation for providing excellent service and a successful business strategy. In an effort to maintain its position as a premium airline, the airline was also among the first to buy the 747.

However, the 1970s were plagued by conflict and domestic strife, which made Air India and Indian Airlines struggle. Indian had unique difficulties because it ran a number of unprofitable routes and had to take care of its old fleet. India changed its mind about regulation in the 1990s, during the height of its financial crisis, and once more permitted commercial airlines.

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The deregulation of India attracted foreign investors as well; Lufthansa invested in the joint–venture airline ModiLuft, although it was unsuccessful. ModiLuft did eventually evolve into SpiceJet, the main low–cost carrier, nevertheless.

The aviation boom in India started in the 2000s. Numerous low–cost airlines put full–service carriers like Air India and Jet Airways under pressure. Reduced airfares offered by low–cost airlines allowed millions more people to travel and put pressure on the more established carriers.

The low–cost carriers IndiGo, SpiceJet, GoAir, and AirAsia India were notable examples. These airlines continue to expand and now account for more than 70% of the domestic market. India has become the third–largest aviation market as a result of the proliferation of airlines and inexpensive fares, and thousands of additional aircraft will be needed over the next few decades.

Numerous foreign airlines have been drawn to India's expanding aviation sector. With over a dozen cities apiece and a sizable market share, airlines like Emirates and Qatar have developed into prominent long–haul carriers.

2.3 AIR TRANSPORT IN INDIA :

The liberalisation and privatisation policies' introduction in India had a considerable impact on the industry. Prior to about 10 years ago, most Indians considered flying to be a pipe dream. However, due to India's rapid economic development and improvements in the air traffic situation, flying is becoming more and more accessible to the population. Over the time period, there were a lot more airlines.

In order to accommodate more aircraft, airports are being extended. There is a surge in air travel, and low cost airlines are quickly taking over as the main operators in the nation. According to market share, the top four airlines for domestic travel are Jet Airways, Indian Airlines (now known as Indian), Air Sahara (now known as Jet light after merging with Jet Airways), and Air Deccan.More than 80 cities in India are connected by these airlines. Following the deregulation of Indian Aviation, three of these, Jet, Indian, and Sahara, also fly internationally.

Even so, air travel originated in India on February 18, 1911, when Henri Piquet flew a Humber bi–plane from Allahabad to Naini carrying mail. But on October 15, 1932, J.R.D. Tata, the father of Indian civil aviation and the creator of Air India, departed from Drigh Road Airport in Karachi in a tiny, light single–engine De Havilland Puss Moth on a journey to Bombay via Ahmedabad, marking the beginning of regular services in India. Former RAF pilot Neville Vincent took over from J.R.D. Tata in Bombay and flew the Puss Moth to Chennai (formerly Madras) via Bellary. Neville Vincent had travelled to India from Britain three years earlier on a barn–storming tour during which he had investigated a number of potential air routes.

The first airline in India was Tata Airlines. It was made up of a Leopard Moth, a Puss Moth, and a palm–thatched shed, a full–time pilot aided by Tata and Vincent, a part–time engineer, two apprentice mechanics, and an endless supply of hope. Tata Airlines flew 1,60,000 miles, carried 155 passengers, and shipped 10.71 tonnes of mail in 1933, the first full year of business. It was changed into a public company in 1946 and given the name Air India. Air India intended to launch its worldwide operations in the second half of the 1940s. In 1947, an agreement was made for the establishment of Air India Foreign Limited to run international services in order to accomplish this. At Air India's request, the Indian government consented to limit theirOn June 8, 1948, Air India International launched its international operations with a weekly Lockheed Constellation trip from Mumbai to London via Cairo and Geneva.

The early 1950s saw the financial standing of different Indian airlines decline to the point where the government chose to expand and nationalise the aviation sector. On August 1, 1953, two independent Corporations were established as a result. In 1953, the Air Corporation Act was developed and adopted. It represents a significant turning point in Indian civil aviation history. Eight domestic airlines merged to establish Indian Airlines, which ran domestic flights while Air India International ran international ones. In 1962, Air India International stopped using the word "international."

Indian Airlines, which was established after the Air Corporations Act was passed, was given the duty of providing air transportation both within the nation and to its neighbours. Indian Airlines was tasked with assimilating different aspects of the eight nationalised commercial airlines in order to deliver coordinated, sufficient, safe, efficient, and cost–effective aviation services. The airline started operating on August 1st, 1953. Indian Airlines received a fleet of 99 aircraft at the time of nationalisation, made up of a variety of aircraft types that were subsequently replaced by the Viscount, F27, and HS748. Since 1964, when the Caravelle aircraft was added to the fleet, Indian Airlines has been operating jet aircrafts.

Indian Airlines began receiving the first batch of wide–bodied Airbus A320 aircraft (19 aircrafts) in June 1989, a period between 1970 and 1982. The Airbus A319, Indian Airlines' newest acquisition, was added to the fleet in December 2005. By operating services with its own aircraft and through code–shared flights, Air India has expanded its global network from the three stations it served at the time of nationalisation to 44 now.

Up until the middle of the 1990s, government–owned airlines dominated air travel in India. In FY 1992, Air India carried over 2.2 million passengers. The main local airline, Indian Airlines, also operated international routes to adjacent nations. In FY 1989, it carried 9.8 million passengers and had a load factor of more than 80% across its fifty–nine aircraft.

In the early 1990s, Vayudoot–another public sector airline–also operated domestic flights. In between smaller cities, it offered feeder service. Vayudoot was acquired by Indian Airlines in 1994. Pawan Hans, a different publicly traded firm, offers helicopter service, primarily to offshore regions and other places that are inaccessible by fixed–wing aircraft. Numerous foreign airlines offer international service in addition to the Indian–owned carriers. 42 airlines provided air travel to, from, and via India in 1995.

Significant changes in India's air transport environment occurred in the 1980s and 1990s.Nationalization strategy gradually gave way to privatisation and liberalisation. Indian economy was influenced by globalisation.Also affected by privatisation is the air transportation industry. A few private airlines, like East West, Modiluft, and NEPC, began operating domestically. As the government changed its approach to policy in line with the "Open Sky Policy," the rate of privatisation increased. The economic situation and the percentage of people who are able and willing to fly have both increased significantly. As a result, demand for air travel increased. India's six private airlines carried more than 10% of all domestic passengers in 1995. East West Carriers, Jagsons Airlines, NEPC, Continental Aviation, and Damania Airways were the principal private airlines.

2.4 RISE OF LOW COST CARRIERS :

Because to liberalisation, the Indian aviation industry has changed. The entry of LCCs into India has made the hopes of many Indians a reality. However, LCCs in India have suffered large operational losses that led to the bankruptcy of a few carriers. Due to rising fuel prices, stringent government rules, strikes, and infrastructure concerns, Indian LCCs are currently experiencing difficulty. When taken as a whole, these restrictions cast doubt on the long–term viability and growth of Indian LCCs in the nation's aviation industry.

New carriers like Air Sahara, Jet Airways, Damania, and East West Airways were among the first to arrive. These new airlines were formed by less well–known but financially secure Indian corporations like Tata and Birla. By providing a variety of services to their customers, the new airlines carved out a space for themselves in the market. For instance, Jet Airways' dependability and superior level of service make it the preferred airline for business travellers. Similar to this, Damania Airways established a reputation as an upscale carrier by offering upscale on–board services to its customers. Similar to this, Air Sahara focused on establishing air connection in a small number of the country's underdeveloped or undeveloped regions.In 1994, only Jet Airways and Air Sahara were still in business; other newcomers were unable to offer evidence of a workable strategy for surviving in the Indian markets. This business saw yet another upheaval with the entry of India's first low–cost carrier (Air Deccan) in 2003 as the cartel of the big operators at the time was broken (Air India,

Indian Airlines, and Jet Airways). LCC's business strategy has been successful in large part because of a big untapped market (the majority of Indians are middle class and cost–conscious) and new competitors' more intelligent business techniques. The Indian aviation industry is currently serviced by eight LCCs, which also includes the fundamental service options offered by former behemoths like Air India and Jet Airways.

Direct ticketing, which bypasses booking brokers and other middlemen to considerably cut prices, is a prominent feature of Indian LCCs. This strategy ensures that airlines will profit even before passengers aboard aircraft. The homogeneous fleets and approach of the LCCs also ensure lower maintenance expenses. LCCs can also leverage their market position to put pressure on manufacturers to increase the seating capacity by re–evaluating the designs.

When operating in India, the LCCs make use of the same aircraft and airports. Due to the fact that both LCCs and full–service carriers offer frequent flights to well–known areas, there aren't many variations between them. They also exchange flight plans, cabin crew, performance, and dependability data from FSCs. They provide the same quantity of checked bags and uniformity as FSCs. In some areas, such as cabin staff, LCCs can actually outperform larger carriers in terms of customer service. Because of this, it is challenging to distinguish between the economy class services offered by the LCCs in India and those offered by the FSCs. However, FSCs can only provide premium cabins on a limited number of itineraries.

2.5 MAJOR PLAYERS IN INDIAN AIRLINE INDUSTRY :

The aviation sector in India is one of the sectors with the quickest growth rates, and it currently holds the third–largest domestic market in the world. Despite the fact that the industry is having difficulty during COVID19, no depression lasts forever. Since then, the leading companies in the Indian aviation industry have expanded significantly.

Interglobe Aviation (IndiGo) :

Low–cost travel is available from IndiGo, an Indian airline with a base in Gurgaon, Haryana. Rahul Bhatia of InterGlobe Enterprises and Rakesh Gangwal launched the business in 2006. With a 59.24 percent domestic market share as of August 2020, the airline is the biggest in terms of the number of passengers transported and the size of its fleet. The business serves domestic Indian markets as a low–cost carrier. As one of the few airlines to maintain profitability for ten years, the firm is increasing the number of aircraft in its fleet.

SpiceJet :

Another low–cost carrier, SpiceJet, is situated in Gurgaon, Haryana. According to passengers transported, the business is India's second–largest airline, with a market share of 13.6% as of March 2019. With support

from Lufthansa, the airline was founded as ModiLuft in 1994, but it discontinued operations in 1996. Ajay Singh bought the business in 2004, changing its name to SpiceJet, and the airline launched its inaugural flight in May 2005. SpiceJet began operating with two leased aircraft and now has a fleet of more than 90.

Jet Airways :

Founded in 1993 as an air taxi company, Jet Airways is an Indian international airline with its headquarters in Mumbai. It began operating international flights in 2005 after transforming into a full–fledged airline in 1995. With a market share of 21.2 percent in February 2016, it was one of the biggest Indian airlines. But owing to competition and a pricing war, the business suffered a setback that forced it to declare bankruptcy and stop operating in April 2019. On May 20, 2022, Jet Airways' AOC (Air Operator Certificate) was renewed, enabling the airline to resume regular business.

Air India :

Bharat Ratna J. R. D. Tata launched Air India, formerly known as Tata Airlines, in 1932. The airline was renamed Air India after 1945 and became a public limited company. Air India Limited, a government–owned corporation, owns Air India, which has its main office in New Delhi. It is the largest international carrier operating from India and has an 18.6% market share. As of January 27, 2022 after the sale was finalised by Air India Limited's previous owner, the Government of India, Talace Private Limited, a Special–Purpose Vehicle (SPV) of Tata Sons, acquired it. On July 11, 2014, the airline, the only airline from India in the alliance, joined as the 27th member.

Air Asia (India) Limited :

Operation of AirAsia (India) began on June 12th, 2014. In 2013, Air Asia India was founded as an Indian airline as a result of a joint venture between Tata Sons and Air Asia Investment Ltd. (Malaysia). Additionally, the airline marked the Tata Group's return to the aviation industry after a 60–year sabbatical. Air Asia held a 6.2 percent market share as of July 2020. There are more than 30 aircraft in the airline's fleet. The airline's main office is in Chennai.

Vistara :

Indian full–service airline Tata SIA Airlines limited, doing business as Vistara, is based in Gurgaon and has its hub at Indira Gandhi International Airport. Another airline that was created through a joint venture between Tata and another major carrier is Vistara. As a joint venture with Singapore Airlines, the airline was established in 2013. With its first flight between Delhi and Mumbai, it began operations on January 9, 2015. The Sanskrit word for "limitless expanse" is the source of the name Vistara. As of July 2020, Vistara controlled 4.2 percent of the market. 42 aircraft are in the airline's fleet.

GoAir :

Go First, formerly known as GoAir, is a Mumbai, Maharashtra–based ultra–low–cost airline. The Wadia Group, an Indian commercial giant, owns it. As of July 2005, it had a market share of 3.8 percent after beginning operations in 2005. The airline has a 55–aircraft fleet. With an 8.4% market share of passengers in October 2017, it was India's fifth–largest airline. Prior to appointing JPMorgan to find new investors, the airline had considered a merger with Spicejet. The airline had anticipated filing for an IPO this year as part of its effort to raise finance, but these plans have since been postponed.

❑ **Check Your Progress :**

1. Which airline supported to found ModiLuft in 1994 ?
   a. Singapore Airlines b. Lufthansa
   c. British Airways d. Air Sahara
2. Who owns GoAir ?
   a. Tata Sons b. Deccan Charters
   c. Wadia Group d. Talace Private Limited
3. Who is consider as the father of Indian civil aviation ?
   a. Vijay Mallya b. Walchand Hirachand Doshi
   c. J.R.D. Tata d. G.R. Gopinath
4. Which of the following airlines is in the Star alliance ?
   a. Vistara b. Jet Airways
   c. AirAsia (India) d. Air India
5. Vistara is a joint venture between _____ and _____.
   a. Air Asia Berhad and Tata Sons
   b. Tata Sons and Singapore Airlines
   c. Singapore Airlines and Luftansa
   d. GATI and Kintetsu World Express
6. ModiLuft is now known as _____.
   a. SpiceJet b. Air India c. Jet Airways d. Akasa Air
7. Jet Airways is an Indian international airline with its headquarters in :
   a. Delhi b. Mumbai c. Hyderabad d. Chennai
8. Which of the following is known as the first airline in India ?
   a. Air India b. Vistara c. Tata Airlines d. Air Sahara

2.6 LET US SUM UP :

India's aviation market has showed excellent recovery numbers, particularly in the domestic sector, following the global trend of aviation markets. On April 17, domestic planes across the nation carried 407,900

passengers. This data shows an almost complete return to pre–pandemic levels and offers more proof of India's bright aviation future.

After the United States and China, India has the world's third–largest aviation market. Having its beginnings in the 1930s. The growing aviation industry in India has attracted a lot of foreign carriers. Airlines like Emirates and Qatar have grown into well–known long–haul carriers, serving more than a dozen cities each and holding a large market share. The implementation of the liberalisation and privatisation policies in India had a significant impact on the sector. Most Indians thought that flying was a pipe dream until approximately ten years ago. Many Indians' expectations have come true as a result of LCCs' introduction into the country. However, substantial operational losses incurred by LCCs in India resulted in the collapse of a number of carriers.

Bharat Ratna J. R. D. In 1932, Tata Airlines–now known as Air India–was established. After 1945, the airline changed its name to Air India and turned into a public limited company. It was acquired by Talace Private Limited, a Tata Sons Special–Purpose Vehicle (SPV). On June 12th, 2014, AirAsia (India) started operating. A joint venture between Tata Sons and Air Asia Investment Ltd. resulted in the founding of Air Asia India in 2013 as an Indian airline (Malaysia). With its headquarters in Gurgaon and its hub at Indira Gandhi International Airport, Tata SIA Airlines limited, operating as Vistara, is an Indian full–service airline. Go First, originally GoAir, is an ultra–cheap airline with its base in Mumbai, Maharashtra. It is owned by the powerful Indian corporation The Wadia Group.

In addition to steady rise in passenger numbers, new airlines are soon to enter the Indian aviation market. While airline start–up Akasa Air is attempting to begin operations shortly, Jet Airways is prepared to make a triumphant comeback with a new hybrid model soon. Additionally, there are significant changes taking place at current carriers.

2.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. b	**2.** c	**3.** c	**4.** d
5. b	**6.** a	**7.** b	**8.** c

2.8 GLOSSARY :

Bankruptcy : A person or business may file for bankruptcy if they are unable to pay their debts or other commitments.

Caravelle : The first jet airliner created exclusively for the short–to medium–haul market and is a member of the first generation of passenger aircraft to utilise newly developed jet propulsion technology.

GDP (Gross Domestic Product) : The total worth of all completed goods and services produced in a nation during a given time period.

Joint Venture : A business venture that is carried out jointly by two or more partners while maintaining their individual identities.

Lockheed Constellation : Starting in 1943, Lockheed Corporation produced the four–engined, propeller–driven Lockheed Constellation. A financial crisis is characterised by a sharp decline in asset value and is frequently brought on by panic or a bank run.

Open Skies Policy : Liberalisation, ease of entry, and terms of usage for national airports by international carriers.

Star Alliance : The first airline alliance in the world to allow passengers to fly to any major city in the world without purchasing additional tickets.

2.9 ASSIGNMENT :

1. What are the benefits to be a star alliance member ?
2. Think why Indian aviation industry comprises mainly of LCCs ?

2.10 ACTIVITIES :

1. Air India is 27th member of star alliance. Find out the other members of it. Moreover also analyse the standard of service among these members.

2.11 CASE STUDY :

The Story of Prem Mathur: India's First Female Commercial Pilot by Pranjal Pande

Long before commercial aviation became popular in India, one woman broke the glass ceiling among pilots. Prem Mathur became India's first female pilot, flying for Deccan Airways, Indian Airlines, and as a private pilot to powerful individuals after passing a number of hurdles. Here's the story.

Born in 1910 (or 1924, reports differ), Prem Mathur broke many norms for women at the time, including challenging the male–only aviation field. Her older brother was a flying instructor, while her younger brother later purchased and sold used aircraft, according to a profile in Feminism In India. During the delivery flight for one such aircraft, Prem joined Captain Atal for a short flight.

While Atal had tried to scare her with acrobatics and other flying stunts, Mathur showed no signs of fear and fell in love with flying. This prompted his suggestion that she become a pilot, an unthinkable idea at the time. However, this sparked a long journey for Prem Mathur.

After receiving her college degree, Mathur began her flying lessons under Captain Atal in 1947 at the newly–founded Allahbad Flying Club. She excelled and quickly received her license, clearing the way for her to fly commercially. However, the path would be far more complicated.

Her first challenge came in the National Air Race held in Kolkata. Despite being discouraged from joining as she was the only woman, Mathur joined the race. She stunned the country by defeating an experienced

field of men and winning the 1949 edition of the race, despite only having a few hundred flight hours. This made her an overnight sensation, receiving praise from to–be Prime Minister Lal Bahadur Shastri and many others.

Despite proving her mettle as a pilot, making the jump to commercial aviation did not come easily again. She moved to Delhi to receive her commercial pilot's license, successfully becoming the first woman to do so. However, advisers asked her to be an instructor instead of going into passenger flying.

Eight airlines went on to reject her application on the grounds of her being a woman, despite her wealth of achievements. It was finally Deccan Airways that accepted her application, making her a co–pilot, first on a six–month unpaid basis. While grateful she could finally fly scheduled flights, Deccan refused to promote her to Captain when the time came, again citing that passengers and crew won't be comfortable with a female pilot.

Prem Mathur quit Deccan Airways a few years later, opting to be a private pilot to business scion G.D Birla. She rejoined with Indian Airlines in 1953, where she was made full Captain. This kicked off a 30–year career that came to an end in 1984, making her the first Indian woman to be a pilot and Captain. She died in 1992.

Mathur inspired a generation of female pilots and started the trend of India being the country with the highest proportion of female pilots globally. While this figure is only 13%, airlines are making a concerted push to hire more non–male pilots and promote the industry far and wide.

Questions :

1. Enlist the reasons of discrimination on the basis of gender in aviation sector.
2. What are the qualities of Ms Mathur which lead her to be a successful female pilot ?
3. How is aviation sector looking towards women employee in present scenario ?

2.12 FURTHER READINGS :

1. India Unbound: from Independence to the Global Information age by Gurcharan Das
2. A Study About Aviation byRishiraj Singh Rathore
3. L'histoire de l'aviationAnne–Marie Deraspe by Alexandre Stanké
4. Journey of Civil Aviation in India by Rajesh Jethwani
5. Simply Fly by G R Gopinath
6. Chapter 8: Mergers and in European Union Competition Law in the Airline Industry, 14 Aerospace Law and Policy Series 111–150 (Kluwer Law International 2017) by John Milligan.

UNIT 03

Air Transportation in Major Parts of World

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- To provide the learner with knowledge about needs of international air transport.
- To provide information about air transportation in major parts of world.

3.1 INTRODUCTION :

In addition to being a significant industry in and of itself, air travel also contributes significantly to broader economic, political, and social processes. The need for its services is derived, as is the case with other modes of transportation, and is motivated by the wants and needs to achieve some other, ultimate goal. Economic development of a region or industry, for instance, can be aided by air travel, but there must first be a latent market for the goods and services that region's or industry's offerings. Lack of air travel can hinder effective growth, just like any other factor in the economy, but inappropriateness or excesses in supply can also be inefficient. Demand for commercial aviation increased at the same time that low cost carrier activity increased in the main nations. However, this rise was insufficient to protect the established airlines against the low–cost carriers.

On a national, regional, and international level, air travel promotes connection and facilitates integration into the global economy. It facilitates

trade, encourages tourist, and produces job possibilities. Projects pertaining to aviation have been sponsored by the World Bank for more than 60 years. The WBG is still actively involved in programmes in every region today that deal with institutional strengthening, capacity building, infrastructure restoration, safety, and policy and regulation of air travel. The World Bank first funded infrastructure projects on its own and provided funding for items like aircraft for state–owned airlines. With the global deregulation of the aviation industry and the privatisation of several state–owned airlines, the World Bank changed its initial emphasis on pure investment to include capacity.

However, there are other useful uses for air travel, such as the transportation of freight or military activities. Air travel is primarily utilised for leisure and tourism.

3.2 NEEDS OF INTERNATIONAL AIR MOVEMENTS :

The world economy has continued to be internationalised and globalised in the twenty–first century. Additionally, there is proof of a deeper political and cultural globalisation. These changes have been aided by air travel and, to a greater extent, the infrastructure supporting air travel have had to adapt to shifting consumer needs. Since air travel serves as a facilitator, demand for its services stems from the need for dependable, quick, and high–quality international transportation. Needs for increased mobility and access are virtually by definition a result of globalisation, but these demands are for different types of people and freight, to different locations, and across different distances than was previously the norm.

International air travel has only been around for a little over a century, yet it has already made a significant contribution to globalisation and is constantly changing to meet the demands of the economic and social integration that globalisation engenders. Globalization helps countries more effectively utilise their comparative advantages economically by facilitating a wider division of labour. Longer term, however, the ability of globalisation to foster labour and technology transfers as well as the dynamism that comes with entrepreneurial activity to foster the development of new technologies and procedures that improve global welfare may be more significant. Air transport has contributed in the past to facilitating static and dynamic efficiency on a worldwide scale by enabling the flows of ideas, goods, and people.

3.3 AIR TRANSPORTATION IN EUROPE :

The European Union has developed the broadest and also most significant example of regional cooperation and liberalisation in the aviation industry during the past 30 years. To the advantage of consumers and businesses, the European Union's single aviation market has evolved as a result of significant changes in the economic and regulatory environment surrounding air travel.

The Treaty of Maastricht, which was ratified in 1992, brought together two intergovernmental cooperation zones, the European Communities, a group of three organisations founded in the 1950s to coordinate activities in particular sectors, and it gave birth to the European Union.

In the economic life of Europe around 15 million jobs and 1 trillion Euros are supported by the aviation industry, which accounts for 4%–5% of total employment and 5% in GDP in European nations. Each individual who works directly in the aviation industry or in tourism that is made possible by aviation supports four more employment outside of Europe. As is well known, the tourism industry is greatly increased by the aviation industry, which is also linked to various augmented products. Additionally, the aviation industry contributes significantly to European tourism. As tourists spend money at restaurants, hotels, shops, tour operators, and on other consumer products and services, this encourages even more economic activity.

In addition to ensuring high standards of safety and security in international air travel, the EU also works more effectively with others to address the effects of aviation on the environment and to protect free competition in an aviation market that is becoming more liberalised and globally oriented. For the benefit of EU business and citizens, the EU's external aviation policy also seeks to address ongoing fragmentation and limited market access. Up until the Council gives the European Commission permission to negotiate a Comprehensive EU Agreement, EU Member States can still negotiate separate bilateral air services agreements. All EU Member States' bilateral agreements with a particular third country are replaced by comprehensive EU air transport accords.

Air traffic management skills are continually being improved by the EU, and the decision–making process has shifted from an intergovernmental practise to the EU framework. Defragmenting the European airspace is implied, along with a reduction in delays, an increase in safety standards and flight efficiency to lessen the aviation industry's environmental impact, and a decrease in service–related expenses.

Despite the fact that the Covid–19 crisis severely affected European airlines, not all of them are in the same position with regard to their resilience to it and their ability to receive government assistance. Particularly, because of the government assistance, several "flag–carrier" businesses in a dire financial situation, like Air France–KLM or Lufthansa, were preserved. On the other hand, a select few major low–cost carriers, like Ryanair or Wizz Air, have the financial wherewithal to weather the storm. Middle–cost businesses like Easy Jet appear to be in a more precarious condition.

3.4 AIR TRANSPORTATION IN USA :

The commercial aviation industry supports nearly 10 million American jobs and accounts for 5% of the country's GDP. Trillions worth of goods

are imported into or exported from the United States by air. The States has the biggest air travel market of any nation. Due to its location and lack of a high–speed passenger rail network, domestic flight demand is very strong. Additionally, the U.S. is important as a hub for international travel. There are many different airlines that make up the American airline business. Although some airlines also use helicopters, most airlines provide both passenger and cargo air transportation services using jet aircraft. The air travel market in this nation is the greatest of any nation. Every year, millions of passengers and approximately sixty thousand tons of cargo are being transported and it is growing continuously. It also boasts one of the biggest airlines for passengers. United Airlines, American Airlines, and Delta Air Lines and are prominent among them.

The airline business in the United States was born and raised during a period of regulation and subsidy. The Post Office began managing airmail lines operated by US Army pilots and planes in 1918. To serve the fledgling airmail service, a basic transcontinental infrastructure of navigational lights and airfields was built. The Contract Air Mail Act, popularly known as the Kelly Act after its major congressional backer, was approved by Congress in 1925, permitting the Post Office to award routes and payments to commercial air carriers. Cost overruns, inefficiencies, and political scandal led to frequent and somewhat chaotic modifications in the system of route awards and subsidies during the next decade, including a brief and disastrous return to all–Army service in 1934.

Despite the turmoil of the time, the "Big Four" airlines, United, American, Trans World, and Eastern, can trace their roots back to this period. Although the others survived, Eastern was eventually liquidated as a result of industry liberalisation.

In the 1970s, pioneers like Southwest Airlines Co. helped bring in mass air travel in the United States. The U.S. airline industry's deregulation during the same decade encouraged the use of low–cost carriers. The 1978 Airline Deregulation Act moved some of the government's power over air transport to the private sector. The once–powerful Civil Aeronautics Board (CAB) was ultimately abolished as a result in 1984.

Between 1990 and 2020, the low–cost carrier revolution swept across the globe. In the 1990s and 2000s, the LCCs arrived in Asia. In the majority of nations, there are still major national airlines. During the coronavirus outbreak, Italy even renationalized Alitalia. For years, low–cost carriers had been improving. However, their existence was in jeopardy due to the coronavirus's intense stress, particularly in younger markets.

3.5 AIR TRANSPORTATION IN ASIA PACIFIC :

Asia Pacific region (APAC) is a geographically differentiated region, which includes a large portion of East Asia, South Asia, and Oceania and is characterised by its proximity to the Western Pacific Ocean. South–East Asia, India, China, Korea, Japan, Australia, and New Zealand are all part of this uniquely diverse region. They have differences in temperature

and topography, an uneven population distribution, a diversity of languages and cultures, as well as by varying political histories and levels of economic development. With a mix of religions and 14 languages spoken in more than 23 countries, its culture is both rich and diverse.

The region consist of world's two largest population hence a great opportunities as customer. In other words it can be said that it is a fastest growing markets and cannot be ignored by any business or Industry. The aviation industry in the Asia Pacific area is expanding at an unparalleled rate. The enormous number of aircraft scheduled for delivery to carriers in the area in the future supports the expectation that this high growth rate will persist in the ensuing decades. It is predicted that by 2030, air travel in Asia would surpass that in both Europe and North America put together. Large–scale regional economic effects from aviation are being produced by this growth. However, there are worries that some of the potential future economic benefits of aviation are at risk since the regions aviation infrastructure development is not keeping up with demand growth.In Last unit of this block we have already study about India now we will have a brief look on other major country of this region.

There are many airports in the Asia Pacific region, many of which rank among the biggest in the world in terms of passenger traffic. Airports in the Asia Pacific area handled a third of all travellers in 2019. However, covid–19 impacted adversely to entire aviation industry. But during first half of 2022 the industry is showing quick recovery. Among the busiest airports in the Pacific region are Beijing Capital International Airport in China, Tokoyo Haneda Airport in Japan, Dubai International Airport, and IGI India etc. Australia is the fifth largest market. This emphasises the significance of comprehending the advantages of air travel in fostering economic integration and growth in the Asia Pacific. In addition, several airports in the region have severe capacity limits, this implies that if growth had not been restrained, traffic levels at a number of Asia Pacific airports would have been even higher.

Singapore's success as a trading centre and business hub has been attributed to a wide range of reasons, including business legislation, government policy, taxation, local population education and skill levels, geographic location, historical legacy, etc. However, one significant element is the calibre and variety of air services offered at Changi Airport, the nation's primary airport. Without the extensive aviation connectivity that the airport offers, Singapore's status as a hub for international trade and commerce would not be conceivable. High–value domestic exports are transported internationally via the airport's air service, and personnel of multinational corporations can travel to clients, regional offices, and the corporate headquarters. Without the mobility that Singapore enjoys, many of the companies having regional headquarters there.

Airports in the Asia Pacific region handle a massive volume of cargo in addition to passengers, partly due to the need for imported goods and the accessibility of labour at reasonable prices. The Asia–Pacific region's

aviation freight and passenger traffic has increased significantly over the past ten years as a result of the region's robust economic growth and increased trade and economic integration on a regional and international scale. Although in much of the region public finances have been the primary source of funding for airports, governments have increasingly turned to privatisation or are seriously considering it as a means of bringing in the private sector to help build new airports or repair existing airports. The following five papers, which were published in this special section on the air transport industry in the Asia–Pacific region, are introduced, examine pertinent topics, and provide a brief overview of airport privatisation in the Asia–Pacific region.

3.6 AIR TRANSPORTATION IN GULF COUNTRY :

Gulf Cooperation Council (GCC), a grouping of six Middle Eastern nations including Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman, is a political and economic partnership. In May 1981, the GCC was founded in Riyadh, Saudi Arabia. The goal of the GCC is to bring its members together around shared goals and comparable political and cultural identities. 42 airlines provide service to the GCC, 11 of which are commercial operators with an emphasis on passenger transportation. The largest airport in the Gulf country is Dubai International Airport. It is among the busiest airports in the world and serves as the main international airport for the United Arab Emirates.

Early in the 1980s, Gulf Air quickly expanded its network, necessitating the purchase of new aircraft. Midway through 1983, Gulf Air cut the number of weekly flights to Dubai from 108 to 41 and concentrated most of its operations out of its hub in Bahrain. Sheikh Mohammed bin Rashid Al Maktoum, the ruler of Dubai at the time and Prime Minister of the UAE, had the ambitious goal of "breathing new and modern life" into Dubai by creating an air transportation network as the foundation of its economic activity.

Both the demand for commercial aviation and the activities of low cost carriers increased in these areas. However, this rise was insufficient to protect the established airlines against the low–cost carriers. As a result, several airlines had to modify their business plans and methods of operation to take into account the new competitors. Many airlines had trouble matching the low fares of the low cost carriers. Due to their significantly higher cost structures, legacy carriers were unable to compete on pricing with low cost carriers.

❑ **Check Your Progress :**

1. Changi Airport is situated in _____.

   a. Malaysia b. Singapore c. UAE d. Thailand

2. GCC comprises of six _____ country.

   a. North American b. European

   c. Middle Eastern d. Western

3. Which of the following is not a part of APAC nations.
   a. Australia b. India
   c. Mauritius d. Papua New Guinea
4. Kelly Act was approved by US Congress in the year of _____.
   a. 1992 b. 1925 c. 1984 d. 1978
5. The demand of air transportation in USA is increased due to _____.
   a. Lack of a high–speed passenger rail network
   b. Lack of Interest in other mode
   c. Out of fashion
   d. None of these
6. CAB was being abolished in year of _____.
   a. 1884 b. 1984 c. 1978 d. 1995
7. Airline Deregulation in US aviation industry came into existence in the year of _____.
   a. 1884 b. 1984 c. 1978 d. 1995
8. Maastricht is a city in the country of _____.
   a. Germany b. France c. Great Britain d. Netherlands

3.7 LET US SUM UP :

The importance of air travel in the global economy is highlighted by the fact that it contributes to the growth of tourism, international programmes, and interregional collaboration. Its weight is increasing annually. The number of international firms has increased, which has boosted business travellers' mobility a factor that is crucial for airlines.

The air transportation sector is increasingly significant it contributes around 1% of the US and EU GDPs and essential to numerous sectors, including tourism, exotic goods, and high technology. It plays a significant role in the transportation of valuable but light loads. By value, international aviation transfers around 40% of global trade, but moving a much smaller percentage in terms of volume. The market is supplied by a variety of carriers, some of whom focus on short–haul domestic routes and others on long–haul international routes.

The implications of globalisation in all of its forms have been profound for the international air transport industry, not only on the demand side, where the scale, nature, and geography of demand in global markets has resulted in significant shifts, but also on the supply side, where implicit and explicit international coordination of policies by governments (e.g., regarding safety, security, and the environment) and the private sector (e.g., the internationalisation of airlines) has resulted in significant shifts.

The European Union has developed the broadest and most successful example of regional market integration and liberalisation in the aviation industry during the past 30 years. To the advantage of consumers and businesses, the European Union's single aviation market has evolved as a result of significant changes in the economic and regulatory environment surrounding air travel.

3.8 ANSWERS FOR CHECK YOUR PROGRESS :

1. b	**2.** c	**3.** c	**4.** b
5. a	**6.** b	**7.** c	**8.** d

3.9 GLOSSARY :

Augmented product : A product enhanced by the addition of related services and benefits

Deregulation : The process of removing governmental restrictions or guidelines from an economy or business

Globalisation : The spread of the flow of financial products, goods, technology, information, and jobs across national borders and cultural boundaries.

Liberalisation : The removal of state regulation of economic activity.

3.10 ASSIGNMENT :

1. What are the current trends and development in Air transportation after Covid–19 ?

3.11 ACTIVITIES :

1. Read some articles on adverse effect of Russia–Ukraine war–2022 on global air transport system.

3.12 CASE STUDY : :

A Detailed Case Study on the Marketing Strategy of Air India by Aditya Shastri

Air India is an airline service provider in India. It is owned by the Government of India. It is a member of Star Alliance, which is one of the largest airline alliances in the world. When it was founded in 1932, it was originally owned by TATA sons. It became a public limited company in 1946. Air India since then has strived to be the best in the airline industry in India.

To keep up with the market, learning the digital ways of conducting marketing and business are a must. IIDE helps you learn these new–age skills, now a mainstay of the current professional environment.

Knowing how to effectively use digital space to advertise and showcase your brand to a tremendous number of consumers is one of the most sought–after skill sets. We provide different types of digital

marketing courses for all kinds of learners– students, graduates, and professionals.

In the Air India case study, we discuss the competitive analysis, digital presence, SWOT analysis, and also some marketing campaigns. In its marketing mix, advancements in all the sectors like the Product, price, place, promotions, etc have been carried out.

Air India Marketing Mix

Marketing strategy helps companies achieve business goals & objectives. For a better understanding of strategies used by Air India we will now look at their 7P model of Marketing Mix:

Product :

Air India is one of the leading airlines in India providing international and domestic travel services. Air India once had 2 products; passenger and cargo transport. However, the cargo transport was decommissioned in 2012. It only operates through passenger transport. It uses Boeing and Airbus planes for the same.

Premium lounges and flight entertainment are some of its main products. To reduce cost and maintain the quality level, it even leases a few of its fleets. The vast network of routes possessed by Air India enables it to cater services across the most important cities and business centers globally. It provides a high level of safety to ensure repeat service purchase of its passengers.

Price :

The route of air traffic, the distance, and the number of halts on the way are some of the factors that affect the prices. It follows competitive pricing as airlines are a highly competitive space. At the same time, there are two types of price, within a flight :Economy class and Business–class

Air India prices airline tickets are easily accessible to middle–class families. Premium pricing is primarily done to target Business class passengers as they have a high tendency to pay and avail themselves of premium services.

Place :

Being the primary choice of airline travel, Air India's service base has been increasing year on year. Place in Air India doesn't matter much as nowadays everything is online. Online retail sites like yatra.com, make my trip, Expedia has Air India airlines listed on their portal, and this is where people can buy Air India tickets. They have also tied up with various agencies to sell their tickets, thus increasing their service base and capabilities.

Promotion :

By promoting their tagline, "Air India.. Truly Indian", it sets up a standard as it is fully controlled by the government. It offers trade

discounts and trade tie–ups to promote its business. Their point of purchase is ticketing counters at traveling agencies, online options, tourist packages, etc.

Besides this, regular banners and promotional activities are done by Air India. Its promotion activities continue via the IRCTC portal, thus it makes it easy for the consumers to plan their journey accordingly. Air India implemented a short–term promotional strategy with Amadeus.

People :

Air India's expert and professional work base have helped him to achieve the top position in the industry. From pilots to security personnel everyone believes in the best service quality to the customers to give them the best flight experience. This has been possible only because of the highly professional working base of Air India.

Physical Evidence :

Air India has its physical evidence through very spacious airplanes, accessible airport kiosks, easy–to–use websites, etc. their premium lounges are very comfortable to be in. With a fleet of excellent airplanes and a high level of amenities, it provides consumers the best travel experience and so they make multiple purchases.

Process :

Air India has numerous processes to ease the business. From the purchase of tickets to delivery of luggage, Air India has it all step by step so that customers can have a smooth transition. Premium lounges make waiting for aircraft easy. Online portals of booking tickets make these processes easy for both passengers and Air India. In case of any unfortunate incident such as flight reschedule, delay or cancellation, Air India makes sure that the passengers don't face any kind of inconvenience.

The aviation industry has very tough competition. A company should be well aware of its strengths and weaknesses to remain on top of the leaderboard. For the same, let's check out the SWOT analysis of Air India.

SWOT Analysis of Air India

The purpose of this comprehensive SWOT analysis of Air India is to analyze Air India's internal and external environments. It looks at the airline's strengths and weaknesses. This also seeks to discuss the possibilities that Air India could pursue and the threats that it should keep an eye on.

Air India Strengths :

- ✓ Strong backing by the government
- ✓ Updated fleet, competent repairs, and maintenance expertise
- ✓ Presence in 20+ countriesCovers approximately 50 destinations
- ✓ Unique image of 'Maharaja'
- ✓ Largest Air carrier in traffic volume and company assets

- ✓ In–flight entertainment and Lounge services
- ✓ Online ticketing and low prices

Air India Weaknesses :

- ✓ Political intervention
- ✓ Low profitability
- ✓ Growing competitor base
- ✓ Lack of clarification about the strategic path
- ✓ Low productivity, low power usage

Air India Opportunities :

- ✓ Expansion of routes and international destinations
- ✓ Solve internal issues
- ✓ Tourism would raise demand
- ✓ Increase in India's GDP
- ✓ Opportunity to launch Low–Cost Carrier

Air India Threats :

- ✓ Stiff competition on its foreign routes
- ✓ Small local airlines and their prices
- ✓ Rising fuel costs
- ✓ Losing market share
- ✓ Rising labor costs

Marketing Strategy of Air India

A marketing strategy helps a company to achieve business goals and objectives. the company has proven to be a major contender amongst most of the other airlines of India. However, even though the company seeks to be India's major ambassador to the rest of the world, it is bound to face a lot of competition, considering the vast amount of competition in a country as big as India itself. Let's check out how Air India markets itself.

The brand utilizes undifferentiated techniques because of which it is missing out on business sectors share in a business of this sort. To make an unmistakable picture in the brain of clients, it utilizes a mascot for making a brand picture of neighbourliness and rich legacy, along these lines it utilizes. Value–based situating strategies are also heavily implemented by Air India. Several factors, along with governmental aid have also assisted Air India with arising as the biggest worldwide Carrier out of India.

Segmentation Strategy :

Elements like age, sex, and psychographics/distinctive demographics assume a significant part in gathering the populace based on comparable qualities in the business of this company, in particular. Air India utilizes

a blend of socioeconomics, psychographics, and geographic division systems.

The brand uses an undifferentiated target strategy due to which it is losing out market share in the competitive market. It uses a mascot to create a distinctive image in the mind of the consumers. The positioning strategy designs the company's image and product to occupy a significant place in the consumer's mind. It uses a Value–based positioning strategy for creating a brand image of hospitality and a rich strategy.

Brand Equity :

Brand equity is the value premium generated from a product when compared to the generic equivalent. It operates one of the youngest fleets in the world and regular upgrades ensure that they provide a superior flight experience to its customers.

- ✓ It is a full member of the Star Alliance Network
- ✓ Won Reader's Digest Trusted Brand Gold Award
- ✓ Received IATA Safety Audit for Ground Operations (ISAGO) recognition for ground services
- ✓ Won Emerging Freighter Services of the Year Award at Air Cargo India Exhibition and Conference
- ✓ Won PATWA International award at ITB, Berlin, as Best Asian Airline from Europe to India
- ✓ Won Galileo Express TravelWorld Award, for Best Short–haul International Airline from India

The marketing strategy of Air India is quite adequate, but the panorama of the market is gigantic. Many competitors have arisen since the launch of the company. Let's dig deeper into it.

Competitive Analysis :

Whether the famous Maharaja mascot or the fact that the public sector undertaking is backed by the government and many others have collectively helped Air India to emerge as the largest international Carrier out of India. With more than 1400 pilots and 2100+ cabin crews, Air India is reaching out to more than 30 countries globally in addition to domestic locations.

Air India commands more than 16% market share through its international operations.

Cost structure plays a pivotal role in the operations and competitive landscape of the companies operating in the industry which consists of fuel, administrative cost, rental of flight equipment, ticketing sales & promotions, user charges, Pax services, flight crew Salary & expenses.

Air India along with its wholly–owned Kochi based subsidiary Air India Express Limited (AIEL) compete with companies like Indigo, Jet Airways, Go Air, Air Asia, Spicejet And more in the national & regional

market. While companies like Etihad, Oman Air, Thai Airways, Singapore Airlines, Emirates are some rival airlines in the international space.

IndiGo leads the market by conquering 43% of the market share. Following IndiGo, Jet Airways is second (12%) and SpiceJet, third with 13% of the market share. Here, Air India ranks fourth and captures only 11% of the market share.

A company's connection with its consumers is crucial. They should market themselves such that they relate to the audience and thereby, build trust. Let's look at some of its marketing campaigns.

Air India Marketing Campaigns

Marketing campaigns promote products through different types of media, such as television, radio, print, and online platforms. It not only promotes the product but also sends a meaningful message to connect with the customer. Campaigns carried out by Air India guarantees the best and the safest travel experience.

Mascot: Probably India's most recognizable mascot, the Air India Maharaja is usually depicted standing with his hands folded graciously in a namaste or bowed with his hand over his heart to welcome his guests. But now, the mascot has various other transformations. Let's look at some of them.

A dig at Indigo :

Air India released two advertisements on Twitter in a veiled thread at IndiGo after a video showed one of its employees entering into a scuffle with a passenger. After the assault incident of IndiGo, Air India took a dig at IndiGo and promised "unbeatable service" with the letter 'beat' in blue– the theme color of IndiGO. The second one depicts Air India's mascot 'Maharaja' in his trademark style with the tagline, "We raise our hands ONLY to say namaste"

IndiGo came in for criticism on Twitter for the incident with some calling for its boycott.

War Ads: Air India and IndiGo are in war ads. Air India is stepping up its advertising campaign to lure consumers. Air India put up an advertisement on a wall panel right behind IndiGo's check–in counters with a message– "Next time fly with Air India and feel the difference.". It doesn't mention any rival but the strategic placement says it all. Even IndiGo didn't back off. It replied Air India with an advertisement.

However, such aggressive marketing is a first for the national carrier. Air India is trying to muscle its way into the consumer's mind with high pitch advertising and discount offers.

Digital is the new name. You need to be alert, adaptable, and executive on the trends. Having a digital presence makes it easy for consumers to browse through your portfolio even when you are sleeping. It facilitates easy access without labor and rent. Let's see how JSW Steel cracked this.

Air India's Digital Presence: Digital presence is as important as a marketing strategy. In today's time, each one of us is hooked up with different social media and to be active on each platform is a must.

- ✓ On Instagram, Facebook and Twitter,
- ✓ Promotes new operations and routes
- ✓ Contest results
- ✓ Pictures of their meals provided by them
- ✓ Pictures of their fleets
- ✓ Pun intended captions
- ✓ New features like "web check–in"
- ✓ Their pilots in their workplace
- ✓ Interaction through festive posts

Engagement with their followers is nearly equal to zero as there are no such activities or campaigns carried out on either of their social media platforms.

Covid protocols: Some undeniable procedure before boarding the flight

They retweet the news articles which are about themOn Linkedin, the posts are the same as Instagram, Twitter, and Facebook. Insights and job vacancies are updated by the company.

The impact of social media on business is no doubt huge. Organizations understand the essence of social media in building the brand and increasing the overall revenue.

Air India should boost their social media game real quick because it is what can result in a big impact on its marketing.

Conclusion :

Air India has established its position as India's largest and most effective air carrier on all fronts, according to the extensive studies done and information gathered. Their service is up to date and relevant, serving millions of passengers on a regular basis.

They aggressively position themselves in the market using a variety of promotional tactics, including campaigns and social media, to keep consumers informed about future packages and more. Consumers see their low prices as a competitive advantage and selling feature. Overall, their marketing and commercial tactics have been effective in propelling them to new heights while remaining innovative.

After reading above case study now think about following Questions :

1. What was the stiff competition for Air India ?
2. What would be the face of Air India if the other rather than government backup ?

3. What segmentation strategy did Air India followed ?
4. Why did Air India collapsed ?

3.13 FURTHER READINGS :

1. A History of International Civil Aviation: From its Origins through Transformative Evolution by Alan Dobson
2. Air Transport in the Asia PacificBy David Timothy Duval
3. Aviation CenturyThe Early Years by Ron Dick, Dan Patterson, Amanda Lane
4. The Timechart of Aviation History by Anthony A. Evans
5. .Babu P George, Alexendru Nedelea– International Tourism
6. World Geography &Development Perspectives, Abhijeet Publications
7. A Review of History, Structure, and Competition in the U.S. Airline Industry by G. N. Cook
8. Recent Trends in World Tourism by Chandra. R.

UNIT 04

Regulations in Air Transportation

UNIT STRUCTURE

4.0 LEARNING OBJECTIVES :

- To provide the learner with objectives, needs, significance and limitations of policy and regulations in Air transport.
- To make learner understand aboutrules and regulations in Indian aviation industry
- To understand the importance and developments in economic and environmental aspects in Air transportation.

4.1 INTRODUCTION :

For developing nations, tourism is one of the most crucial means of economic expansion and currency absorption. The tourist business is being developed in numerous nations around the world, which is fostering economic expansion and employment development. The economy also gets its nutrition from tourism, which is seen as a stimulant. The travel and tourism sector is one of the largest companies in the world and is growing quickly. The rise of this business is predicted by bright futures, new travel destinations, new visitor demographics, and evolving tourism niches.

Moving people away from their places of origin and permanent residence is the main method that tourism is accomplished. Regulatory bodies are established to ensure the smooth operation of transportation. IATA had a significant impact on air travel. IATA regulations are based on suggestions made by governing bodies like the ICAO and standards developed by industry working groups made up of representatives from member airlines and pertinent industry associations that cooperate with IATA.

The Paris Convention of 1919 was the first international meeting to address the regulation of air commerce and competing claims of national sovereignty of airspace as the number of international aviation routes expanded quickly. The conferees came to the conclusion that each country has complete sovereignty over the airspace above its borders and waterways, and as a result, has the authority to control access to and use of its airspace. On the other hand, the conference aimed to promote air travel by creating guidelines that applied uniformly to all airlines and provided the greatest amount of freedom of movement. Even though only 11 states, excluding the United States, ratified the convention in the end, it offered the foundational ideas for later regulation.

4.2 OBJECTIVES OF AIR TRANSPORT POLICY AND REGULATION :

Flying by air differs from other modes of transportation due to its freedom and agility in allowing activities to easily cross previously limiting geographic and political boundaries. Aviation regulation offers the necessary power, accountability, and penalties to tame this freedom. Similar to how civil order is essential to contemporary civilization, aviation regulation is critical to the sector.

Commercial aviation has been subject to strict legal and regulatory oversight almost from the beginning. This was necessary for the preservation of life and property as well as for grounds of national security, defence, consumer protection, and national economic interest. Early ballooning incidents were documented to have resulted in property damage, and the courts were obligated to render judgement.

More than 190 sovereign governments have approved the Chicago Convention of 1944, which updated and replaced the Paris Convention of 1919, as the convention on international civil aviation. These nations have consented to uphold the technical and operational standards created by the International Civil Aviation Organization (ICAO), which are described in the 19 Annexes, as required by international air law.

The goals of the air transport policy and regulation programme are to increase consumer benefits and choices, decrease State costs associated with carrying out its economic regulatory functions, improve air connectivity, and create more competitive business opportunities in the marketplace, all of which will support long–term economic growth and the growth of trade and tourism.

4.3 MULTINATIONAL REGULATIONS :

The body of laws known as international law governs relations between sovereign governments and those organisations that have been given international personality. The term "international personality" in the context of aviation refers to institutions like the United Nations' ICAO, which is also a significant participant in international law.

International conventions describe and give these organisations an international identity. International law has frequently been regarded as not being a "real law" because there is no sovereign international authority with the jurisdiction to execute judgments or even compel individual states to observe standards.

However, the prevalence of honoured bilateral air service agreements between countries and the significant and broad participation of international organisations like ICAO and IATA in aviation,

It would be impossible to deny the existence of an international law given the nearly universal acceptance of international accords governing international civil aviation.

Public international air law is the area of international air law that governs relations between contracting states and other international actors. True charters of public international air law include the Paris Convention of 1919 and the Chicago Convention of 1944. The legislation governing private disputes, in which one or more parties may be from another state, is contrasted with this concept. Conflict in this area is governed by "private international air law."

In essence, international air law is a synthesis of both public and private international air law. Its primary goal, according to some, is to provide a framework of regulation for international civil aviation and to resolve any contradictions or conflicts with local air law.

Convention law, which is composed of multilateral and bilateral agreements between sovereign states, is the main source of international air law.

Virtually every aspect of air law in international aviation is based on the idea of sovereignty. 26 Allied and Associated countries had to decide whether this new means of transportation would follow the mostly unregulated nature of international marine operations or whether governments would seek to regulate this new technology at the Paris Convention in 1919. Realizing the value of aviation as well as its potential to challenge the sovereignty of states and their inhabitants was made possible by the First World War.

It is significant to note that the Montreal Convention 1999's entrance into force does not render carriage under the Warsaw system no longer legally enforceable. Roundtrip flights leaving from a country that is not a signatory to the Montreal Convention 1999 and one–way flights between two countries that have both ratified the Montreal Convention 1999 are

still subject to the Warsaw Convention 1929. When both the country of origin and the country of destination have ratified the agreement, it is applicable to all international air transportation.

The Montreal Convention 1999 (MC99) establishes airline liability in the case of death or injury to passengers, as well as in cases of delay, damage or loss of baggage and cargo. It unifies all of the different international treaty regimes covering airline liability that had developed haphazardly since 1929.

4.4 NATURE, SIGNIFICANCE AND LIMITATIONS :

According to data published in 2017 by the International Air Transport Association, there was one incident with an irate passenger for every 1,053 flights. Approximately 8,371 incidences of disruptive passenger behaviour were reported in 2017 alone. The increasing frequency of these catastrophes is causing airlines, governments, and passenger constant distress. Passengers' safety and security are adversely affected by these accidents because of their severity. However, due to legal gaps, these passengers frequently escape punishment.The rules of international law still hold true in this era of globalisation. Since the early 1980s, the global economy has undergone significant structural changes that have led to the liberalisation of capital, labour, intellectual property rights, and other areas.

Aviation authorities develop and uphold a set of norms known as airline regulations. Airlines are required to abide by these significant requirements in order to keep air travel secure and straightforward for all passengers. Regulation of the aviation industry is to create the world's safest, most effective aircraft system. The regulation of civil aviation advances both economics and passenger and aircraft safety. Additionally, it promotes and advances civil aviation, including cutting–edge technology. Authorities and regulators continue to consider new air traffic control and navigation systems for both military and commercial aircraft. The National Airspace System and civil aviation can help execute these policies because research and development is the essential component of every enterprise.

Only the aviation sector has adopted international treaties like the 1944 Chicago Convention to this extent. This specific treaty not only has an impact on all civil, commercial, and, to a greater or lesser extent, military aviation activities, but it also raises the bar for the industry's operational, technological, safety, and security standards. Studying international air law is essential for developing a complete understanding of aviation as well as the legal concepts that form the basis of all aviation law. Only the aviation sector has adopted international treaties like the Chicago Convention to this extent.This specific regulation affects all aircraft activities, including those that are domestic, foreign, and, to a greater extent, military.

The distinction of aviation as a sector can be attributed to both its growth and the restrictions imposed on it. These two aspects of aviation, though they differ somewhat, actually share a great deal, which

essentially explains why there are more of one than the other. The need for international standardisation in the aviation law sector is greater than in any other sector.

Strict regulations have traditionally applied to aviation activity. For instance, to safeguard the safety of the people and property below, the Paris police established flight permits soon after the Montgolfier brothers released the first hot–air balloons in 1783. International harmonisation is not only increasing but significantly accelerating in the pursuit of universal aviation activity conformity.

4.5 RULES AND REGULATIONS IN INDIA :

Aviation law addresses all of the legal concerns associated with flight. The justification and importance of aviation law are rooted in the expansion of human contact as we go from the seas to the sky and beyond, as well as in globalisation. The body of laws governing how airspace is used and their benefits for aviation, the general public, and governments everywhere. The regulation of the world's airspace is a concern. A wide range of legal concerns are covered by aviation law, including tax and environmental regulations as well as liability for injuries sustained during air transportation. Only the aviation sector is exempt from WTO regulations.

Air law can be defined as "the set of rules governing the use of airspace and its benefits for aviation, the general public, and states throughout the world." Control of the world's airways is a topic of air law. The growth of the national economy and tourism is aided by the air transportation of people and cargo. Today, aviation is an important national industry in the majority of the world's regions.

The Air Corporations Act of 1953, which nationalised all carriers engaged in India's civil aviation industry, was adopted by the Indian government in order to address the weak financial standing of the country's civil aviation industry. In 2008, the Airports Economic Regulatory Authority of India Act was passed, creating the organisation (AERA). AERA controls tariffs and other aviation expenses, and it keeps track of airport performance standards.

In the context of airport regulation in India, AERA takes the following elements into account:

- ✓ In the case of both Brownfield and Greenfield airports, the Government of India has made land available for purchase to airport developers at a very low cost, typically under the Land Acquisition Act. Airports are natural monopolies and public utilities.
- ✓ With 108 countries, India presently has bilateral Air Service Agreements (ASAs). While 72 foreign airlines operate into and out of India, four domestic private airlines–Jet Air, Kingfisher, SpiceJet and IndiGo Airlines fly to 35 locations across 25 nations. The national carrier, Air India (Now acquired by Talace Private Limited), flies on a number of international routes, to North America, Europe,

Africa, Gulf countries, Middle East, and West and East Asia. India plays a significant role in the civil aviation and has a sizable fleet of aircraft. There are more than thousand registered aircraft and approximately 500 airports in the country. India also have non–scheduled air transport companies.

The aviation industry has been gradually liberalising since 1986. Both international and domestic routes are now open to private carriers. India is liberalising its policies within the scope of bilateral air services agreements by giving multinational airlines more traffic rights. India has suggested to ASEAN an open skies policy. India also provided SAARC nations with more frequencies and landing strips. For international freight, the open skies policy is still in place. Foreign tourist charter flight regulations have been loosened.

The primary regulatory authority in charge of overseeing civil aviation in India is the Directorate General of Civil Aviation. It is in charge of handling safety–related issues, regulating air transportation services, enforcing civil aviation laws and regulations, and other similar duties. Along with the International Civil Aviation Organization, it coordinates its operations (ICAO). Maintaining standards for air safety and airworthiness is one of its key responsibilities.

In India, the governance and management of the aviation sector under the purview of the Ministry of Civil Aviation (MoCA). It is essential to the establishment and implementation of numerous governmental policies and initiatives that are meant to advance civil aviation. It is also in charge of coming up with plans for the civil aviation industry's effective expansion. It guarantees the application of numerous laws, including the 1934 Aircraft Act.

4.6 AIRCRAFT ACT 1937 :

In accordance with the Aircraft Act of 1934, the Aircraft Rules of 1937 were established. This Act and the Indian Penal Code, 1860, were both applied to the unruly travellers. This legislation outlines the ideal conduct that is anticipated of travellers. The issue with this regulation was that it only mentioned the best behaviour, which was problematic. It did not offer a way to avoid harsh penalties or other consequences. As a result, the Indian Penal Code's mentioned provisions had to be used. The issue at this point was that occasionally, the disruptive behaviour of the passengers did not constitute an actual "offence." In other cases, bail would be issued right away.

As a result, no legal action could be taken against such disruptive passengers, and they were free to behave whatever they pleased without fear of legal ramifications.

Two new regulations were added to the Aircraft Rules 1937by the DGCA in 2010. To control the disruptive passengers on board either local aircraft or international flights headed towards India, this was done. Part

III [General Safety Conditions (21 – 29D)] of the Rules has been updated to reflect these changes. There arerule 1 to rule160 which are divided into 14 parts and some parts like Part X, part XII and Part XIII are divided into subpart too. Although all the part and schedule is important for air transportation operation and management but here we will discuss few rules from part–III i.e. General Safety Conditions:

Rule 21 : According to Rule 21 of amended rule,No pilot shall operate an aircraft in such a manner as to impose an unwarranted risk on any person or property, whether due to low altitude, proximity to people or buildings, or for any other reason.

Rule 22 : Instances of violence and other dangerous actions of interference against a crew member are covered by Rule 22. No one on board an aircraft is permitted to engage in acts of verbal or physical abuse, intimidation, or threatening behaviour toward a member of the crew. Any behaviour by the passengers that interferes with the crew's capacity to fulfil their tasks or limits their ability to do so is prohibited.Additionally, in order to ensure the safety of the aircraft, the crew, and the passengers on board, no passenger shall disobey a legal direction issued by the aircraft commander, i.e., the pilot–in–command, or on their behalf by a member of the crew.

Rule 23 : The assault–like behaviours and other risky behaviours that compromise the safety of the passengers, crew, and the aircraft as well as the order and discipline on board are covered by Rule 23. This regulation states that no one on board an aircraft shall engage in any of the following behaviours that could jeopardise the safety of the air: verbally or physically assault, intimidate, or threaten another person; intentionally damage or destroy property; or consume alcoholic or narcotic beverages or drugs.

In addition, the rule states that India has the authority to prosecute such offences committed aboard ships en route to or from countries other than India in situations where: In order to have this rowdy passenger prosecuted, the aeroplane commander transferred him to the appropriate Indian authorities. A similar request has not been made to, and won't be made to, any other State, the pilot–in–command must also certify. The fact that these rules give the government the ability to take the appropriate measures against such disruptive passengers makes them a welcome addition to the industry for all airlines.

Rule 24 : This rule emphasizes on Prohibition on consumption of intoxicating and psychoactive substances. No person shall have consumed or used any alcoholic beverage, sedative, narcotic, or stimulant drug or preparation within twelve hours of the start of the flight or consume or use any such preparation during the flight, nor shall such person, while so acting or carried, be in a state of intoxication or hysteria.

- ✓ No company running a domestic air transport service in India is allowed to provide alcohol on board such a service, and nopassengers flying on such a service are allowed to drink alcohol while on board.
- ✓ The privileges of the licences and related ratings may not be used by licence holders while they are under the influence of any psychoactive substance that could prevent them from using the privileges of the licences and ratings in a safe and appropriate manner.
- ✓ License holders are not permitted to use chemicals in problematic ways.

Rule 24A : Carrying individuals with mental illnesses or epilepsy in aircraft is prohibited by law. According to Rule–24A, No one may knowingly carry, authorise to be carried, or assist in the carriage of an individual with a mental illness or epilepsy in an aircraft. With the caveat that this restriction shall not be applicable if the person to be carried is certified by a registered medical professional to be fit to travel by air without posing a risk to other passengers or the aircraft, and in addition:

- ✓ Has not consumed or used any alcoholic beverage or preparation within twelve hours prior to the flight;
- ✓ Is kept under proper sedation, if in a state of excitement, during the flight and stops en route; and
- ✓ Is accompanied by an attendant, provided that if he has previously required sedation due to excitement within the two weeks prior to the flight's start date, he is also accompanied by a registered medical professional and sufficient escort who are each individually and jointly responsible for making sure that the person in their care does not consume any alcohol and is kept appropriately sedated throughout the flight.

Rule 24B : Prisoners cannot be transported aboard or carried on board an aircraft unless a written permit has been issued by the Director–General, a Deputy Director–General, the Director of Regulations and Information, or another officer of the Civil Aviation Department that has been given this authority by the Central Government. The permit must also include any conditions that the Director–General deems necessary.

Rule 24C : Transportation of animals, birds, and reptiles in aircraft: Unless specifically authorised by a general or special written permit issued in this regard by the Director–General and subject to such conditions, if any, as may be specified therein, no animal, bird, or reptile shall be taken aboard or transported on any aircraft to, from, or within India.

Rule 25 Smoking in Aircraft : The owner, operator, and pilot–in–command of every aircraft registered in India are required to display or arrange for the display of notices indicating where and to what degree smoking is prohibited or permitted inside the aircraft.

A notice allowing smoking in such an aircraft may only be displayed there if smoking is authorised by the aircraft's airworthiness certificate or by a directive from the Central Government, and only when smoking is authorised in accordance with the restrictions outlined in the certificate or directive.

No one may smoke :

- ✓ In any area of an aircraft or in near vicinity to it where a sign prohibiting smoking is posted.
- ✓ Anyplaceon board an aircraft during take–off, landing, refuelling, or any time a notice prohibiting smoking is temporarily displayed.

Rule 56 Indian Aircraft Operating outside India : When an Indian–registered aircraft is used in a foreign nation, neither the aircraft nor any of its parts or equipment may be changed, repaired, replaced, inspected, or refurbished without the permission of, and certification from, the Indian government.

- ✓ In the case of a Contracting State, a person who has been given the go–ahead for the task by the relevant authority in accordance with the minimal standards determined in accordance with the Convention and acknowledged by the Director–General as adequate for the task;
- ✓ In the case of a nation that is not a Contracting State, a person with credentials that the Director–General has determined are sufficient for the job.

4.7 REGARDING ENVIRONMENT :

Airlines only generate 2% of global greenhouse gas emissions, according to the International Civil Aviation Organization (ICAO), but they are estimated to have a 3.5 percent influence on global warming due to other variables including condensation trails. By 2050, the contribution would increase to 15% in the absence of intervention. Since 2008, when airlines were included to the EU Emissions Trading System (EU ETS), the industry has been under pressure to decrease emissions, particularly from the European Union. Many of the foreign and European airlines that were covered by the System vehemently complained. The United States, India, and China were among the nations that prohibited their airlines from taking part in this "cap and trade" scheme.

President Obama of the United States signed legislation in November 2012 asking the Secretary of Transportation to stop American airlines from taking part in any EU plan that was formed unilaterally ("European Union Emissions," 2012). In order to allow for negotiations on a worldwide emissions standard through 2016, flights to and from non–European nations were exempted in 2012 under the "Stop the Clock" proposal. When it became likely that differing emissions standards would exist across nations or global regions, airlines contacted the International Civil Aviation Organization (ICAO) to create a global standard that would be

acceptable to both airlines and government environmental regulatory bodies. It was a little unexpected that a tentative agreement was reached in the beginning of 2016 considering the quantity of airlines, specialists, and interest groups engaged.

Emissions will be lowered in half by 2050 compared to the baseline year of 2005 under the proposed accord, which must be approved by the ICAO 36–State Governing Council. The requirement pertains to aircraft producers, who must demonstrate lower emissions on new aircraft, with the lower emissions depending by aircraft size.

Even though the plan is a genuine step forward, it might not be as ambitious as it first appears. The aim should be simple to reach, as many observers have highlighted, as Airbus and Boeing are just starting to launch numerous new fuel–efficient models, notably Airbus's 320s and 350s and Boeing's 737Max and 787 Dreamliner. In fact, Boeing claims to support the standard wholeheartedly.

The industry will probably face pressure to reduce emissions even further despite the new threshold. Numerous airlines have tested biofuels with great success; they lower greenhouse gas emissions. However, compared to petroleum–based jet fuel, biofuels are significantly more expensive. Biofuels are anticipated to continue to be economically uncompetitive with petroleum for the foreseeable future even if production costs will decline as production scales up. Operating expenses will rise if biofuels are required in aviation fuel blends to minimise emissions.

4.8 ECONOMIC REGULATION :

To limit this market dominance and to provide airlines and their customers with ongoing improvements in cost effectiveness and service quality, economic regulation is both required and desired. IATA supports competent, independent, powerful, and robust economic regulation.

The 1929 stock market crash in the United States caused a global depression. The government of President Hoover was unable to stop the downward economic spiral. When Franklin Delano Roosevelt was elected president in 1932, one of his first actions was to conduct a witch hunt of the Hoover administration's personnel and policies.

Hugo Black, an Alabama senator who subsequently served as a justice on the Supreme Court, began holding hearings in 1934 to look into the Spoils Conference and the airmail contracts amid unfounded claims of collaboration by former Postmaster Brown and the Department of Commerce.

Political theatre was created out of bidding scandals, garnering considerable public interest. Roosevelt ordered the new Postmaster General, James A. Farley, to cancel all active airmail contracts, which angered the airline sector and turned out to be a disastrous decision. The President instructed the Army to fly the mail despite the absence of suitable aircraft and pilot training. There were 66 crashes or forced landings over the

following six months, resulting in 12 mortalities. Due to this experience, the Post Office was forced to hand back the mail delivery to the airlines, and Farley started by announcing interim contracts.

The Air Mail Act of 1934 gave private companies back control of the airmail routes, but not without more disruption. Bidding was not permitted for attendees of previous Spoils Conferences. In order to do this, the federal government set out to dismantle the airlines it had earlier founded. However, the airlines were quietly counselled to restructure, giving rise to the most recent iteration of the Big Four.

Transcontinental and Western Air added "Inc." to their names, while American Airways, Eastern Air Transport, and American Airlines all adopted new names. Airlines were compelled to divest from aircraft manufacturers. In order to create United Aircraft Company, Boeing Airplane Company, and United Air Lines, United Aircraft and Transport Corporation divided. The stock of General Motors was sold in Eastern and Western.

The contracts went to Delta and Braniff in addition to the Big Four. The Act assigned the Post Office, the Bureau of Commerce, and the Interstate Commerce Commission separate responsibilities for airline regulation; however, this division of labour quickly proved to be inefficient and burdensome. Regulatory reform was once more brought before Congress within a few years.

In India, The AERA Act of 2008 created the Airport Economic Regulatory Authority, an autonomous legislative organisation. The authority controls the fees charged to airlines for providing aeronautical services. Both the interests of the air travellers and the airline businesses are served by it. The AERA is required by the Act to establish a tariff for the aeronautical services it provides, including landing, housing, and parking of aircraft, support for navigation, surveillance, and communication, and facilities for supplying fuel and cargo to the airlines for improved operations. Prior to now, the authority was in charge of managing the tariffs for all privately owned and leased airports, civil communities, and major airports.

4.9 REGULATIONS FOR ORGANISING:

The market for aviation organisers is made up of a network of numerous interconnected businesses, institutions, and organisations. Airline travel planners are required to offer enticing services of a sufficient calibre. The planning of air travel on a national and worldwide level demands formal personnel qualifications and subject–matter competence. As a result of these ties, employment in the aviation and tourism industries has also increased. To reduce or completely eliminate the risk of the human factor in the planning of the trip, the system of air tourist organisation must operate properly.Primaryduties of these service provider include:to present a thorough calendar of events, paying adequate attention to the relationship with the customer while signing contracts for the provision of travel services based on air transportation, protection of

consumer rights, and any extra features and advantages that contribute to the overall tourism experience related to air travel. Thus the service providing companies focused on the rights and comforts of the tourist.

In accordance with international agreements, particularly the 1999 Montreal Convention for the unification of certain rules relating to international carriage by air, the tourist trip organiser or agent is fully responsible for the proper performance of the obligations arising from the contract concluded with the customer–consumer as well as for non–performance or improper performance of the service. If a trip is included in a tour, the event's organiser is required to disclose all pertinent information prior to the trip.

❑ **Check Your Progress :**

1. Which of the following is the principal domestic law governing the Indian aviation industry is :

   a. Aircraft Act 2010

   b. Air Corporations Act 1953

   c. Aircraft Act 1934

   d. Airports Authority of India Act, 1994

2. Who was the President during 1929 stock market crash in the United States ?

   a. Franklin D. Roosevelt b. Herbert Clark Hoover

   c. Calvin Coolidge d. Woodrow Wilson

3. The governance and management of the aviation sector comes under the purview of the :

   a. Ministry of Human Resource Development

   b. Ministry of Skill Development and Entrepreneurship

   c. Ministry of Civil Aviation

   d. Ministry of Tourism

4. Which of the following can be considered as the first international conference to address the regulation of air trade and competing national claims to airspace sovereignty ?

   a. Paris Convention b. Warsaw Convention

   c. Chicago convention d. Montreal Convention

5. Which of the following president signed legislation in 2012 to stopairlines from taking part in any EU in order to allow for negotiations on a worldwide emissions ?

   a. Donald Trump b. Calvin Coolidge

   c. Barack Obama d. Woodrow Wilson

6. Whichof the following act nationalised all carriers engaged in civil aviation industry in India ?

   a. AERA Act 2008

   b. Air Corporations Act 1953

   c. Aircraft Act 1934

   d. Airports Authority of India Act 1994

7. Which of the following rule of the Aircraft Act governs assault and other behaviours that put people's safety or peace and order at risk ?

   a. Rule 21 b. Rule 22 c. Rule 23 d. Rule 24

8. Which rule of Aircraft actcover Instances of violence and other dangerous actions of interference against a crew member ?

   a. Rule 21 b. Rule 22 c. Rule 23 d. Rule 24

4.10 LET'S SUM UP :

International air law is essentially a blend of both private and public international air law. Some claim that its main objective is to offer a framework for international civil aviation regulation and to address any inconsistencies or conflicts with local air law.

While ICAO establishes criteria for member countries, IATA does so for its member airlines. IATA represents the interests of its airline industry members, whilst ICAO works to establish guidelines and rules for civil aviation.

The principal domestic law governing the Indian aviation industry is the Aircraft Act of 1934. Its main purpose is to give the federal government the authority to establish regulations governing the creation, sale, usage, maintenance, export, import, and safety of all civil aircraft.The civil aviation industry's regulatory authority, the Directorate General of Civil Aviation (DGCA), focuses mostly on safety–related matters. The Airport Economic Regulatory Authority was established as a stand–alone legislative body under the AERA Act of 2008.

4.11 ANSWERS FOR CHECK YOUR PROGRESS :

1. c	**2.** b	**3.** c	**4.** a
5. c	**6.** b	**7.** c	**8.** b

4.12 GLOSSARY :

Airworthiness : The ability to fly in safe conditions and within permitted limits.

Air Law : The area of law that regulates the use of airspace for aeronautical purposes.

Aviation Law : The area of the law that consists of norms and procedures designed, altered, or formed specifically for use in aviation activities.

Bilateral Air Service Agreement : Pact that two countries sign to permit the use of commercial air transportation services between their respective borders.

Conflict of Laws : Laws from various countries that are in conflict with one another on the issue at hand, or laws from the same country that are in conflict with one another.

Epilepsy : A condition where the brain's nerve cell activity is messed up, leading to seizures.

Hysteria : Heightened or uncontrolled excitement or emotion

Perimeter Rule : A federal statute known as the "Perimeter Rule" places restrictions on how far an airline can travel from specific airports.

Plaintiff : Someone who files a lawsuit in court against another party.

Policy : A purposeful set of rules designed to direct behaviour and produce logical results.

Privatization : The procedure for converting a publicly owned airline into a private carrier.

Regulations : Instructions issued in addition to a nation's laws.

Sovereignty : A state's ability to run its own affairs

Special Drawing Rights : an international monetary reserve currency created by the International Monetary Fund.

4.13 ASSIGNMENT :

1. Find out the various regulations designed and implemented by different authorities for Air transportation worldwide.

4.14 ACTIVITIES :

1. Visit your nearby International airport and observe how they are implementing regulations.
2. What are the challenges faced by airport personnel ?

4.15 CASE STUDY :

Guille vs. Swan, 19 Johns. 381 (N.Y. Sup. Ct. 1822)

Charles Guille (defendant) launched a hot–air balloon near an area farmed by Swan (plaintiff). Guille encountered difficulty in the air and ended up hanging off the side of the balloon's basket. As the balloon came down, Guille called for help, attracting the attention of approximately 200 people. Guille's balloon landed on Swan's crops, causing about $15 in damage. However, the crowd of helpers and onlookers broke through fences and trampled additional crops, causing Swan another $75 in damages. Swan sued Guille for the damages. The trial court told the jury that Guille was responsible for all of Swan's damages relating to the

balloon crash, and the jury returned a verdict against Guille for $90. Guille appealed the verdict, arguing that he was responsible only for the $15 of damages he had caused directly.

Procedural History :

Swan sued Guille in the justices' court, in an action of trespass, for entering his close, and treading down his roots and vegetables, &c., in a garden in the City of N. Y.

It was contended before the justice that Guille was answerable only for the damage done by himself, and not for the damage done by the crowd. The justice was of tile opinion, and so instructed the jury, that the defendant was answerable for all the damages done to the plaintiff. The jury, accordingly, found a verdict for him for $ 90, on which the judgment was given, and for costs.The cause was submitted to the court on the return, with the briefs of the counsel, stating the points and authorities.

Court Opinion (including key issues and arguments) :

The intent with which an act is done, is by no means the test of the liability of a party to an action of trespass. If the act cause the immediate injury, whether it was intentional, or unintentional, trespass is the proper action to redress the wrong.... Where an immediate act is done by the co–operation, or the joint act of several persons, they are all trespassers, and may be sued jointly or severally; and any one of them is liable for the injury done by all. To render one man liable in trespass for the acts of others, it must appear, either that they acted in concert, or that the act of the individual sought to be charged, ordinarily and naturally, produced the acts of the others.

I will not say that ascending in a balloon is an unlawful act, for it is not so; but it is certain that the aeronaut has no control over its motion horizontally; he is at the sport of the winds, and is to descend when and how he can; his reaching the earth is a matter of hazard. He did descend on the premises of the plaintiff below, at a short distance from the place where he ascended. Now, if his descent, under such circumstances, would, ordinarily and naturally, draw a crowd of people about him, either from curiosity, or for the purpose of rescuing him from a perilous situation; all this he ought to have foreseen, and must be responsible for. Whether the crowd heard him call for help or not, is immaterial; he had put himself in a situation to invite help, and they rushed forward, impelled, perhaps, by the double motive of rendering aid, and gratifying a curiosity which he had excited. ... we must consider the situation in which he placed himself, voluntarily and designedly, as equivalent to a direct request to the crowd to follow him.

Disposition of Case : Judgment affirmed.

Questions : read the above case, think and answer the following:

1. To avoid such type of loss to civilian, was it necessary to impose some rules and regulations in air transportation?
2. What if IATA, IACO or other regulatory bodies was not established?

4.17 FURTHER READINGS: :

1. Aircraft Leasing Manual: Directorate General of Civil Aviation, India
2. Manual on theRegulationof InternationalAir Transport: International Civil Aviation Organization
3. The Aircraft Rules, 1937 by Department of Industries and Labour Notification, New Delhi, The 23rd March, 1937, Updated: February 17, 2011.
4. Air Transport Management An international perspective by Lucy Budd and Stephen Ison
5. Airline Operations and Management: A Management Textbook by Gerald N. Cook and Bruce G. Billig
6. Air Transport in the 21st Century by John F. O'Connell; George Williams

BLOCK SUMMARY

Airlines businesses offer both scheduled and non–scheduled flying services. Considering that it is mentioned by the appellation that what distinguishes these air services is their dependability. Scheduled airlines usually encounter uncertain demand in comparison to charter flights, which are more likely to have a precise understanding of passenger demand.

Following the worldwide trend of aviation markets, India's aviation market has displayed good recovery numbers, notably in the domestic sector.India has the third–largest aviation market in the world, behind the US and China. Origins date back to the 1930s, numerous international carriers have been drawn to India's expanding aviation industry. Several airlines, such Emirates and Qatar, have developed into well–known long–haul carriers, flying to more than a dozen different locations and dominating their respective markets. LCCs' entry into India has fulfilled many of the hopes of the populace. The Bharat Ratna J. R. D. TatafoundedTata Airlines in 1932. The airline adopted the name Air India after 1945 and became a public limited company. New carriers will shortly enter the Indian aviation sector in addition to the steadily increasing passenger numbers.

The expansion of tourism, international programmes, and interregional cooperation are all aided by air travel.In the past 30 years, the European Union has created the broadest and most successful example of regional market integration and liberalisation.

In essence, public and private international air law are combined to form international air law. According to others, its primary goal is to provide a framework for international civil aviation regulation and to resolve any contradictions or conflicts with local air law. The Aircraft Act of 1934 is the primary domestic law controlling the Indian aviation sector. India's regulating body for the civil aviation sector is the Directorate General of Civil Aviation (DGCA).

BLOCK ASSIGNMENT

1. What are the impacts faced by environment due to rise in airlines ?
2. How aviation industry put its impact on world's economy ?
3. What is the purpose of making alliance in International air transportation ?
4. How chartered planes did come into existence ?
5. "Civil aviation industry has developed mostly in North America and Europe". Justify or counter the statement.
6. How LCCs have changed the face of Indian civil aviation Industry ?
7. What are the impact of clashes between two nations on international air transportation ?
8. What are the challenges faced by authorities in order to implementation of Regulation in Air transport ?
9. What are new amendments can be seen by air transport industry after Covid–19 ?

❖ **Enrolment No. :** ☐

1. How many hours did you need for studying the units ?

Unit No.	1	2	3	4
No. of Hrs.				

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	☐	☐	☐	☐	_____
Language and Style	☐	☐	☐	☐	_____
Illustration used (Diagram, tables etc)	☐	☐	☐	☐	_____
Conceptual Clarity	☐	☐	☐	☐	_____
Check your progress Quest	☐	☐	☐	☐	_____
Feed back to CYP Question	☐	☐	☐	☐	_____

3. Any other Comments

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AIR TRANSPORTATION & DISASTER MANAGEMENT

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AHMEDABAD

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

AIR TRANSPORTATION & DISASTER MANAGEMENT

Contents

Dr. Babasaheb Ambedkar Open University Ahmedabad

BBAATR-302

Air Transportation & Disaster Management

BLOCK 3 : INTRODUCTION TO DISASTER MANAGEMENT

INTRODUCTION TO DISASTER MANAGEMENT

Block Introduction :

All throughout the world, there have been more disasters and emergencies. With the development of technology, learning knowledge and putting it into practise is today thought to be the only practical approach to avert disasters or lessen their impacts. Disaster education attempts to arm people with the knowledge they need to act to lessen their vulnerability to disasters. The question of how well–trained people can be prepared for disasters and respond has received a lot of attention over the past few decades. B oth natural and man–made disasters seriously disturb a community and result in significant financial, environmental, social, and economic losses as well as numerous casualties that are beyond the society's control. The learner will comprehend the disaster, its effects, and the several organisations that are involved in this block.

Block Objectives :

After understanding this block learns will have knowledge and its objectives is :

- To develop a fundamental understanding of the disasters
- To inform learners about the terms associated with disaster
- To make learner familiar with the foundations of disaster management
- To comprehend how disaster affect people
- To explore how wind and water disasters affect the aviation industry
- To understand how industrial hazards affect the aviation industry
- To shed light on the various disaster management organisations
- To inform students of the Disaster Management Act

Block Structure :

Unit 1 : Overview of Disaster Management

Unit 2 : Cause & Impact of Disaster in Aviation Sector

Unit 3 : Role of Different Disaster Management Organisations

UNIT 01

Overview of Disaster Management

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- To provide basic understanding about the disasters
- To make aware about the related terms of disaster
- To know the fundamentals of Disaster Management

1.1 INTRODUCTION :

A disruption on a vast scale, either naturally occurring or caused by humans, that can take place over a short period of time or over an extended length of time is referred to as a disaster. The human, material, economic, or environmental suffering that a society is forced to endure as a direct result of a natural disaster may be in excess of what it is able to bear. According to the available data, India as a whole is susceptible to thirty distinct types of natural disasters, each of which has the potential to disrupt India's economic, social, and human development potential to such a degree that it will have an enduring impact on the country's level of productivity and its overall economic performance.

Human contact with nature, technology, and other living things since the beginning of time has been the root cause of catastrophic events. There are many different kinds of disasters, and each one has the potential

to alter the way in which we go about our everyday lives. These changes might be surprising and swift, or they can be gradual and protracted. The human race, being a creative and resourceful species, has consistently looked for novel approaches to mitigate the destructive consequences of natural calamities. However, the nature of human behaviour in response to natural calamities has been reactive for many years. Communities, sometime being aware of the hazards that they will be facing, but they wait in anticipation of tragic event happening. Then after this tragic event implement plans and procedures. The social and economic growth of humans has further contributed to the creation of vulnerability, and as a result, has reduced the capacity of humans to deal with the effects of natural disasters.

Disasters limit human growth. The degree to which a community is vulnerable to the threat posed by natural disasters is directly proportional to the amount of progress that has been made in the field of development. In the same vein, the level of catastrophe risk that is typical in a community is inextricably tied to the developmental decisions that are made by that community. It has been thoroughly explored and documented that natural disasters and economic progress are linked. It is a generally accepted fact that natural disasters can have a negative effect on development (for example, when a flood destroys a school) and that development can either increase or decrease the risk of natural disasters (for example, when earthquake–resistant building techniques are introduced). Despite this, Africa is hit by natural disasters on a yearly basis, which slows down the continent's growth and leaves our inhabitants living in a condition of constant peril.

Since the international community began placing more of a focus on the need for multi–stakeholder disaster risk reduction rather than perpetuating the unsustainable cycle of disaster management, Africa has made significant progress. The decade of the 2000s saw the development of a variety of declarations, policies, strategies, plans, and initiatives. In spite of the fact that there have been several inter–regional and high–level conversations as well as other types of collaboration, there is very little evidence of actual implementation of the aforementioned on the African continent.

The following lesson will brief you on the subject of lowering one's vulnerability to natural disasters. In the beginning of the lesson, we will be defining some of the most fundamental concepts that are associated with disaster studies. These concepts are also among the most significant. The various components of disaster risk management will receive a lot of attention, and the ways in which these various components contribute to our comprehension and improved management of risk and catastrophes will be discussed to the audience. There will be a discussion on a variety of risks, as well as different susceptibility domains and hazards. This programme will also provide a more theoretical look at the growth of the study of disasters, and as part of that process, an emphasis will be

focused on the multidisciplinary character of disaster risk reduction. As soon as the conceptual groundwork for understanding disaster risk management has been established, the focus will shift to gaining an understanding of how disaster risk management operates as an integrated approach within the context of sustainable development. This will take place after the theoretical foundation for this understanding has been laid. In the final section of this subject, you will get an understanding of some of the challenges that crossover across other areas, such as climate change and adaptation, disaster risk governance, and gender and disaster risk issues.

1.2 DEFINING DISASTER & DISASTER MANAGEMENT :

Disaster :

The word "disaster" comes from the French word "desastre," which is composed of two words: "des," which means "bad," and "aster," which means "star." The English word "disaster" derives from this word. Therefore, "Bad or Evil star" is what the name alludes to.

The term "disaster" refers to "a serious disruption in the functioning of a community or a society that causes wide spread material, economic, social, or environmental losses that exceed the ability of the affected society to cope using its own resources." A disaster can be defined as "A serious disruption in the functioning of a community or a society that causes wide spread material, economic, social or

A disaster occurs when a hazard, vulnerability, and insufficient capacity or steps to limit the possible possibilities of risk all come together at the same time.

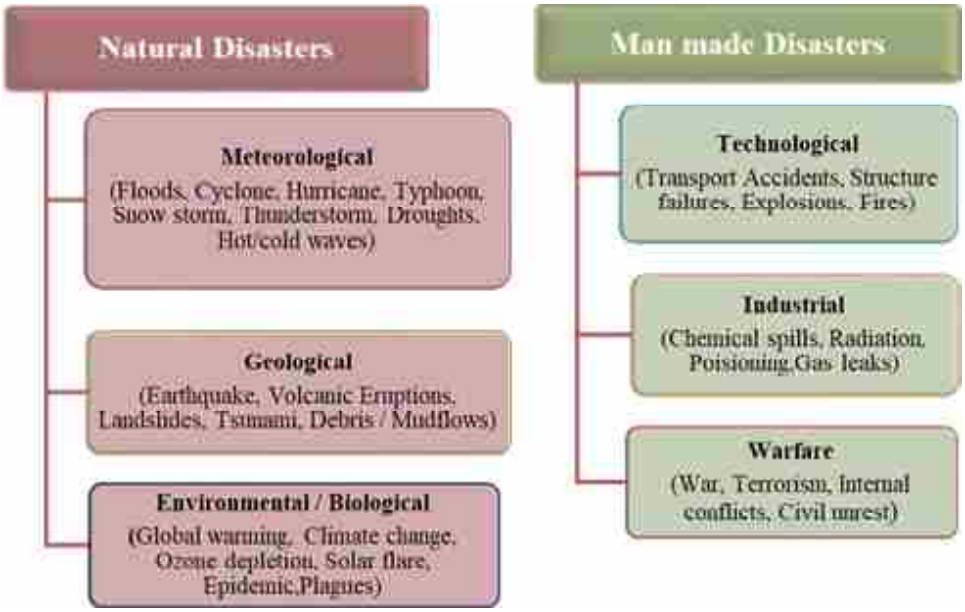
A catastrophe occurs when a hazard has an effect on a population that is susceptible to its effects and produces damage, casualties, and disruption. Any hazard, such as a flood, earthquake, or cyclone that is a triggering event and that occurs in conjunction with greater vulnerability (inadequate access to resources, sick and elderly people, a lack of awareness, etc.), will result in a disaster that causes more loss of life and property.

According to the Disaster Management Act of 2005, disaster management is defined as an integrated process of planning, organising, coordinating, and implementing steps that are necessary for the following:

1. Preventing the threat posed by any disaster
2. The lessening of the likelihood of any catastrophe or the effects of such catastrophe
3. Preparedness to respond to any type of emergency
4. The ability to respond quickly and effectively to a catastrophe
5. Making an evaluation of how severe the effects of any disaster will be
6. Recovery and assistance
7. Rehabilitating and reconstructing the damaged area

1.3 TYPES OF DISASTERS :

Types of disasters usually fall into two broad categories: natural and man–made. Natural disasters are generally associated with weather and geological events, including extremes of temperature, floods, hurricanes, earthquakes, tsunamis, volcanic eruptions, landslides, and drought.



Natural Disasters :

Natural disasters are defined as a natural event that occurs slowly or rapidly and causes immediate widespread devastation on human health leading to death and suffering. Some biological activities, such as rainfall, can also turn into natural disasters when they occur above the average limit. These disasters are mainly characterized by various factors such as their intensity or magnitude, area of the range, duration, speed of onset, etc.

Natural disasters are also harmful to natural resources. They often cause mass destruction. Such disasters harm humans and other species. For example, a natural disaster like wildfire destroys the environment and loss of life for animal habitat. Also, it damages natural resources and property.

Man–Made Disaster :

Disasters can also be caused by humans, either directly or indirectly. Human–made disasters are defined as the events generated by humans primarily in, or close to, human settlements. Such events typically cause environmental or technological emergencies.

Human–made disasters have elements of human intent, negligence, or error that involve the human–made system's failure. Additionally, sometimes disturbances in natural resources also lead to human–made disasters. Some of the most common examples of human–made disasters include terrorism, large–scale crime or mass violence incidents, war, arson, civil disorder, biological/chemical threat, Reduction in consumption resources, etc.

1.4 HAZARDS :

The term "hazard" derives from the old French word "hasard" and the Arabic word "az–zahr," both of which indicate "chance" or "luck." The word "hazard" was first recorded in the 15th century.

A hazard is "any risky condition or event, which threatens or has the potential to cause injury to life or damage to property or the environment," according to one definition of the term.

Dangers can be divided up into two major groups, which are:

1. Natural Hazard
2. Manmade Hazard

Natural hazards are defined as those dangers that are brought on by natural occurrences (hazards with meteorological, geological or even biological origin).

- Cyclones, tsunamis, earthquakes, and volcanic eruptions are all examples of natural hazards because their causes can only be attributed to the natural environment.
- Landslides, floods, drought, and fires are all examples of socio–natural hazards since both natural and artificial factors contribute to their occurrence.
- Flooding can be caused by a number of different things, such as strong rains, landslides, or the clogging of drains with human waste.

Hazards that are caused by humans or their irresponsibility are referred to as manmade hazards.

- Dangers caused by human activity include explosions, the release of toxic waste, pollution, the breakdown of dams, wars or civil unrest, and so on. These dangers are related with industries or energy producing facilities.

"In the strictest sense, there is no such thing as a natural disaster; yet, there are natural hazards. The detrimental effect that a hazard has on a society is referred to be a disaster. Therefore, the magnitude of the damage that a disaster causes is proportional to the degree to which a community is exposed to the risk (conversely, its ability, or capacity to cope with it).

This vulnerability is not natural; rather, it is the product of a wide variety of elements that are always shifting, including physical, social, economic, cultural, political, and even psychological aspects. These aspects influence the lives of people and the settings in which they live.

1.5 VULNERABILITY :

A community's vulnerability can be defined as "the extent to which a community, structure, services, or geographic area is likely to be damaged or disrupted by the impact of a particular hazard, on account of their nature, construction, and proximity to hazardous terrains or a

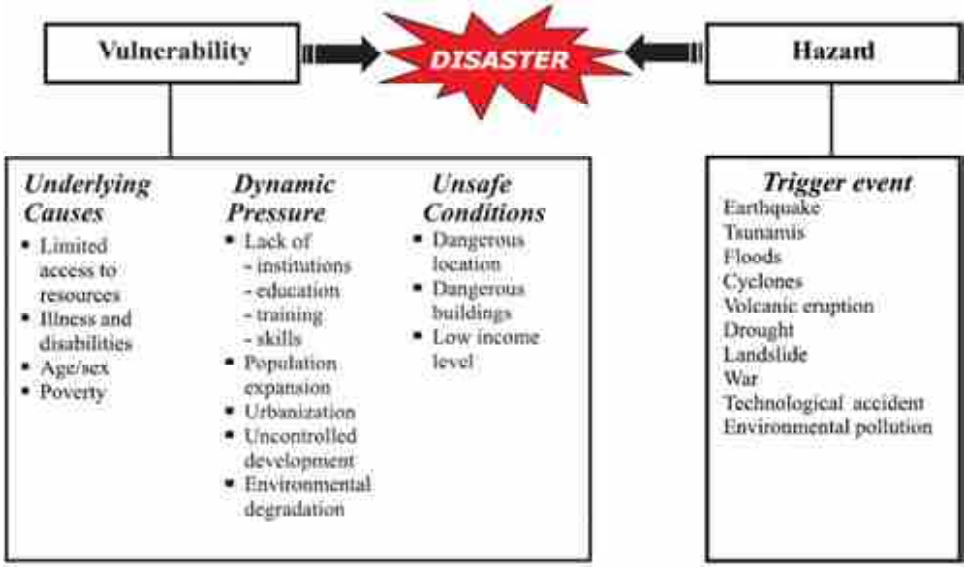
disaster–prone area." Vulnerability can be defined as "the extent to which a community, structure, services, or geographic area is likely to be damaged or disrupted by the impact of a particular

Vulnerabilities can be categorised into :

- Exposure to danger physically
- Socio–economic vulnerability

Physical Vulnerability refers to the likelihood that a natural hazard, such as an earthquake or a flood, can cause injury or death to a person or cause damage to an object. It is determined by the proximity of the people and elements at danger, such as buildings and infrastructure, as well as the nature of the hazard itself and the physical state of those individuals and objects. In addition to this, it refers to the physical capacity of buildings and other structures to withstand the forces that are exerted upon them when a hazard is present.

The degree to which a community is affected by a hazard will not just lay in the physical components of vulnerability but will also depend on the socioeconomic conditions. Vulnerability can be broken down into two categories: physical and socioeconomic. The socio–economic state of the population is another factor that impacts the magnitude of the impact. For instance, those who are economically disadvantaged and who live in coastal areas do not have the financial resources necessary to construct sturdy homes out of concrete. Every time there is a storm with high winds or a cyclone, they put themselves in harm's way and lose their shelters. They, too, are unable to reconstruct their homes because to the poverty that they are experiencing.



The term "capacity" refers to "resources, means, and strengths that exist in households and communities and which enable them to cope with, withstand, prepare for, prevent, mitigate, or quickly recover from a disaster." Capacity can be defined as "resources, means, and strengths that exist in households and communities."

It's possible that capacities are :

1. Capabilities of the body
2. Socio–economic capacity

People whose homes have been wrecked by the cyclone or whose crops have been destroyed by the water may be able to recover some items from their homes and from their farms. If any members of the family decide to move away, whether temporarily or permanently, they may be able to find work thanks to the skills they have acquired.

Capacity in socio–economic matter majority of the time, people experience the worst of their losses in the physical and material realms when a crisis strikes. Because of their money, rich people have the ability to bounce back quickly after a setback. In point of fact, they are less likely to be affected by natural catastrophes due to the fact that they reside in secure places and their homes are constructed using more robust materials.

1.6 RISK :

A "measure of the predicted losses due to a hazard occurrence occurring in a certain area over the course of a specific time period" is what we mean when we talk about "risk." "Risk is a function of both the chance of a given hazardous event and the losses that each would produce."

The following factors influence the level of risk :

- The character of the danger itself
- The susceptibility of the components that are impacted by the event
- The monetary importance of certain components

When a community or area is exposed to risks and has a high probability of being negatively affected by the impact of those hazards, we refer to that community or locality as being "at risk."

1.7 DISASTER MANAGEMENT :

Disaster management is the process by which we "prepare for, respond to and learn from the effects of severe failures." It is how we cope with the human, material, economic, or environmental impacts of a given disaster. Disasters can have human causes, despite the fact that nature frequently causes them.

Examination and management of cause elements are part of disaster management. It necessitates determining the level of a community's disaster resistance. Certain communities are more at risk than others. For instance, poorer areas lack the resources necessary to adequately prepare for a storm or recover from flood damage. Analyzing exposure to loss is another step in disaster management. Homes constructed below sea level, for instance, may be more vulnerable to flooding if a hurricane strikes them.

The following are the fundamentals of disaster management :

- The management of natural disasters is the shared duty of all levels of government.
- Resources those are already available for day–to–day use should be utilised whenever possible in disaster management.
- The operations of an organisation should be seen as an extension of its primary business.
- Each person is accountable for ensuring their own well–being and safety.
- The planning for disaster management should place an emphasis on large–scale events

The difference between an event and a disaster should be taken into account in any preparation for disaster management.

- Disaster management operational provisions are in addition to incident management operational arrangements; they do not replace those plans in any way.
- Planning for emergency management in the event of a disaster needs to take into account the nature of the physical environment as well as the demographic makeup of the people.
- Arrangements for disaster management need to take into account the participation of non–governmental organisations and their potential roles in the disaster response.

Disaster Management Cycle :

The term "Disaster Risk Management" refers to the comprehensive collection of pre–, during–, and post–disaster actions, programmes, and precautions that can be performed with the goals of preventing disasters, mitigating the damage they cause, and recouping the financial losses they cause, respectively. The following are the three primary stages of activities that are engaged in throughout the course of disaster risk management:

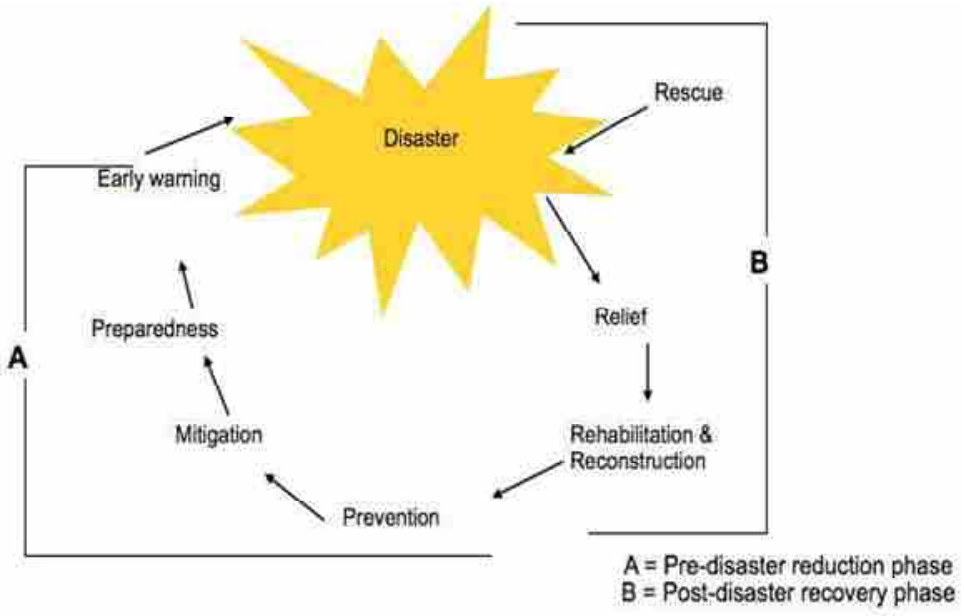
1. Pre–disaster
2. Disaster incidence
3. Post disaster

Pre–disaster (Before a disaster) :

It encompasses all of the measures that were taken to lessen the amount of damage done to people and property by a potential hazard. For instance, carrying out awareness campaigns, strengthening the existing weak structures, preparing disaster management plans at the family and community level, and so on and so forth are all examples of such activities. These kinds of operations to reduce risk that are carried out during this stage are known as mitigation and preparedness activities.

Occurrence of a disaster (During the course of a disaster) :

It encompasses the actions that have been made to guarantee that the requirements and requirements of the victims are satisfied, and that their suffering is reduced to the greatest extent possible. The actions that are carried out during this phase are known as emergency response activities.



Post–disaster (After a disaster) :

It encompasses the actions conducted in the immediate aftermath of a disaster in reaction to it, with the goal of achieving an early recovery and rehabilitation of the communities that were impacted. Activities of this nature are referred to as "response" and "recovery" activities.

1.8 RESILIENCE :

When referring to the natural world, the term "resilience" refers to the process through which an area or eco–system that is under threat is brought back to its original, pristine state. In the fields of building and engineering, the concept of resilience refers to the capacity of a material or a structure to return to its initial state after being subjected to an external force such as weight, pressure, or shock. However, human systems cannot be unaffected by the happenings of life; they do not necessarily revert to an initial or previous condition, and the task, in order to advance, is to continuously develop, improve, and refine the current structures, environments, and systems. A reversion to an original or earlier state is therefore consistent with the tendency of some communities to relocate to more precarious areas and rebuild their homes without making any efforts to improve conditions or increase their prospects of making progress. However, there is always room for development when it comes to resilience.

The United Nations Office for Disaster Risk Reduction (UNISDR) defines resilience as "the ability of a system, community, or society that

is exposed to hazards to resist, absorb, accommodate, and recover from the effects of a hazard in a timely and efficient manner," including "the ability of a system, community, or society to preserve and restore its essential basic structures and functions" (UNISDR, 2009). This concept takes into account the possibility of a threat rather than the occurrence of a catastrophe. It would therefore be inaccurate to refer to resilience once a tragedy has actually occurred; rather, the term "coping ability" should be used. Therefore, resilience and the development of resilience should be considered an essential component of initiatives aimed at reducing the risk of natural disasters.

Therefore, the ability to "bounce back from" a shock is what we mean when we talk about resilience. The degree to which a community is equipped with the required resources and is able to organise itself in advance of and while responding to times of emergency is a major factor in determining the community's level of resilience in relation to the occurrence of potential hazardous occurrences.

❑ **Check Your Progress :**

1. Disaster Management Act of _____

   a. 2003 b. 2004 c. 2005 d. 2006

2. Which of the following is not a man–made disaster ?

   a. Technological b. Industrial

   c. Warfare d. Epidemic

3. Vulnerabilities can be classified into :

   a. Exposure to physical danger b. Socio–economical danger

   c. Both a and b options d. None of the above options

4. Which is the option of fundamental of Disaster Management ?

   a. Disaster management is shared responsibility of all stakeholders

   b. Each individual is accountable for their own well–being

   c. Planning for disaster is a large scale event

   d. All of the above options

5. Post disaster we refer to the activities of _____

   a. Response or recovery

   b. Planning for disaster management

   c. Both a and b options

   d. None of the above options

6. The ability to bounce back from shock is _____

   a. Resilience b. Disaster Management

   c. Relief d. All of the above options

1.9 LETS SUM UP :

In this unit the learners were made aware about the disaster and its various forms. This unit describes hazards, risk and venerability. These are the important concepts to understand disaster in detail. Generally, people think that hazard, risk and venerability can be used interchangeable but that is not the case. They are different from each and hold separate significance in learning disaster.

Measures taken to ensure the safety and protection of people and property against unforeseen natural or man–made disasters are referred to as disaster management. This includes being ready for emergencies, effectively combating emergencies, protecting the safety of life during emergencies, and assisting in the rebuilding of society following an emergency. Rebuilding very rapidly and effectively is also called as resilience in disaster management. This unit give clear and basic understating to all the learners.

1.10 ANSWERS FOR CHECK YOUR PROGRESS :

1. c **2.** d **3.** c

4. d **5.** a **6.** a

1.11 GLOSSARY :

Capacity : The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.

Disaster Risk Reduction : The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Exposure : People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

Emergency Management : The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.

Resilience : The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Risk Management : The systematic approach and practice of managing uncertainty to minimize potential harm and loss.

1.12 ASSIGNMENT :

1. What is the meaning of term Hazard? Classify hazard and quote any real time incident for each classification.

2. Elaborate the term Disaster Management and Disaster Management Cycle.

1.13 ACTIVITIES :

1. Study the recent disaster happen in your area and figure out the work done after this incidence took place.
2. Based on your understanding figure out the resources required to mitigate any natural disaster.

1.14 CASE STUDY :

China denies online rumours' blaming co–pilot for plane crash killing 132

The cause of China's recent passenger plane crash which killed 132 people remains under investigation, a Chinese aviation official has said

The cause of China's recent passenger plane crash which killed 132 people remains under investigation, a Chinese aviation official has said, rejecting online speculation that the co–pilot may be responsible for the tragic accident.

The Chinese passenger plane crashed in the southern Guangxi Zhuang Autonomous Region on March 21, killing all 132 people on board including the nine crew members. The Boeing 737–800 aircraft of China Eastern Airlines, which flew from Kunming to Guangzhou, plunged into the mountains in Tengxian County in the city of Wuzhou.

Rumours have been doing rounds online that the co–pilot "might be responsible" for the crash, attributing it to the data from black boxes, with some believing that the CAAC will require flight crews to undergo mental health monitoring, the state–run Global Times reported.

China's civil aviation regulator, the Civil Aviation Administration of China (CAAC), refuted such rumours over the co–pilot's involvement in the crash of China Eastern flight MU5375, saying the accident is still under investigation, and no conclusions have been drawn on the cause and nature of the accident yet.

The "rumours", claimed to be sourced from some public security departments are misleading, would undermine public confidence in the ongoing investigation, and may represent a violation of the law, said Wu Shijie, a CAAC official told the official media on Monday.

"We will try our best to find out the cause of the accident as soon as possible and release the relevant information according to the law and procedures," he said.

Wu said the crash has had an impact on the welfare of frontline civil aviation workers, and some employees have suffered from emotional strain, particularly younger workers.

The CAAC attaches great importance to the mental well–being of

aviation workers and requested that airlines take measures to support pilots, flight attendants and safety officers in managing their psychological pressure.

Early this month a working group sent by the US National Transportation Safety Board arrived in China to help investigate the crash of the China Eastern Airlines aircraft.

The seven–member panel, consisting of authorised representatives and technical advisors, will participate in the investigation organised by the CAAC.

Airline safety management is focused on the mental state and health of all aircrew, including pilots, and it is a key function of the regulation, CAAC said.

The aviation industry recently held a two–week–long safety review, stating that it had addressed a number of safety hazards, after the fatal crash of Flight MU5375, killing all 132 persons onboard, the Global Times reported.

Concrete measures should be taken to strengthen the investigation of hidden dangers concerning aircraft maintenance, flight weather conditions, personnel qualifications and technical ability, China's civil aviation regulator said.

China's aviation officials have said that there had not been any weather or other hazards endured by the flight on its route path. China Eastern said the plane, less than seven years old, had also passed all pre–flight checks.

There were three pilots, China Eastern officials said. The captain had 6,709 hours of flying experience, and the first and second officers had 31,769 hours and 556 hours respectively.

Questions :

1. What Safety/Security lapses were there in Chinese Eastern Airline in this accident ?

1.15 FURTHER READING :

1. Disaster Management: Text and Case Studies (2007), D.B.N. Murthy, Deep & Deep Publications
2. Textbook of Disaster Management (2013), Dr Nitesh Kumar, Satish Serial Publishing House
3. Disaster Management (2021), A.K. Srivastava, Scientific Publishers (India)

UNIT 02

Cause & Impact of Disaster in Aviation Sector

UNIT STRUCTURE

2.0 LEARNING OBJECTIVES:

- To understand the effect of disasters on human beings
- To study the affect of wind and water disaster in aviation sector
- To know about affect of industrial hazards on aviation sector

2.1 INTRODUCTION :

Unfortunately, dealing with the aftermath of natural disasters is a crucial component of future planning in many parts of the world. This is especially true for airports located in areas that are prone to natural disasters. Airports frequently serve as a haven for individuals trying to escape the havoc that natural disasters like hurricanes or earthquakes cause as they try to get out of the affected area. Additionally, airports serve as the primary hub for inbound aid and relief personnel.

When a disaster strikes, aviation transportation is frequently the only practical means of transportation for first responders and critically needed relief supplies. Most highways, train tracks, and even ports become impassable after an earthquake, tsunami, or hurricane because of the days-long obstruction caused by debris. On the other hand, airports are highly resilient and typically resume operations within hours.

Different relief agencies have been coordinating with one another to reopen airports so that they are fully prepared for possible natural disasters.

2.2 EFFECTS OF DISASTERS :

Depending on the qualities of the exposed elements and the event's specifics, a disaster's effects can vary. The population, the environment, and the physical components of housing, business, industry, and public services are the aspects that are at risk.

Direct and indirect losses are two different categories for the impacts. The number of victims damage to public infrastructure, building damage, damage to the urban area, industry, trade, and environmental deterioration, or physical alteration of the habitat, are all examples of physical damage that is tied to direct losses.

Social effects, such as the disruption of public services, the media, and the negative reputation a region may develop in the eyes of others, can be categorised under the heading of indirect losses. Economic effects, on the other hand, can be categorised under the heading of disruption of trade and industry as a result of the decline in production, disincentives for investment, and the cost of rehabilitation and reconstruction.

There have been tragedies in developing nations, such as those in Latin America and the Caribbean, when thousands of people have killed and hundreds of millions of dollars have been lost in only thirty seconds. Although they frequently cannot be determined, the direct and indirect costs represent a sizable portion of a nation's GDP. Due to the frequent occurrence of various disasters, the average annual losses from natural disasters in the region account for a sizeable portion of the GNP. Because it involves unplanned expenses that have an impact on a country's economic progress, this translates into population stagnation and poverty.

Preventive actions against the consequences of catastrophes should be viewed as a vital component of comprehensive development at the regional and urban levels if current levels of risk are to be lowered. The cost of taking preventive measures should be weighed against the cost of recovering from disasters, and risk analyses should be taken into account when evaluating the social and economic aspects of each region or nation. This is because disasters of the magnitude mentioned above can have a significant negative impact on the development of affected communities.

2.3 WIND DISASTER AFFECTING AVIATION SECTOR :

Cyclones :

A cyclone is a zone of low air pressure surrounded by high atmospheric pressure, causing whirling atmospheric disturbance and strong winds that blow in opposite directions in the northern and southern hemispheres, respectively. The world's tropical and temperate climates are where they are most common.

Typhoons and hurricanes are other names for cyclones. Typhoons are storms that originate in the Southern Pacific between longitudes of 100 and 180 degrees east. Due of the devastation caused by wind, rain, and flooding, these storms have the potential to cause enormous havoc.

One of the regions of the world most vulnerable to disasters is the Indian subcontinent. Nearly 85% of India is subject to one or more hazards. 22 out of the 28 states and 8 union territories are vulnerable to disasters. Different regions of the world have different names for cyclones :

- **Typhoons** in the Northwest Pacific Ocean west of the dateline
- **Hurricanes** in the North Atlantic Ocean, the Northeast Pacific Ocean east of the dateline, or the South Pacific Ocean
- **Tropical cyclones :** the Southwest Pacific Ocean and Southeast Indian Ocean
- **Severe cyclonic storm"** (the North Indian Ocean)
- **Tropical cyclone** (the Southwest Indian Ocean)
- **Willie–Willie** in Australia
- **Tornado** in South America

General Characteristics :

Cyclones in India are moderate in nature. Some of the general characteristics of a cyclone are :

1. Strong winds
2. Exceptional rain
3. Storm surge

The development of a cyclone covers three stages namely

(a) Formation and initial development state

Four atmospheric/ oceanic conditions are necessary for the formation of a cyclone :

- A warm sea with a depth of 60 metres and a surface temperature of over 26 degrees Celsius, which evaporation produces a lot of water vapour in the atmosphere.
- High relative humidity (the amount of water vapour in the air) at altitudes up to 7,000 metres makes it easier for water vapour to condense into droplets and clouds, release heat energy, and cause pressure to drop.
- When rising air condenses, atmospheric instability (an above average decrease in temperature with altitude) promotes significant vertical cumulus cloud convection.
- The Coriolis force, which is caused by the rotation of the planet, can be used to induce cyclonic wind circulation around low pressure centres in locations that are at least 4–5 latitude degrees from the Equator.

(b) Fully Matured

A spiral pattern of extremely turbulent huge cumulus thundercloud bands is the primary characteristic of a tropical cyclone that has completely developed. These bands form an inward spiral that wraps around a region of relative calmness and forms a dense, dynamic cloud core. This is referred to as the cyclone's "eye." The eye seems to be a dot or a black hole encircled by dense clouds. The term "eye wall" refers to the dense cloud's outer perimeter.

(c) Weakening or Decay

A tropical cyclone begins to weaken as soon as its source of warm moist air is abruptly cut off. This is possible when the cyclone hits the land, on the cyclone moves to a higher altitude or when there is the interference of another low pressure.

Indian Hazard Zones :

The 7516.6 kilometres long Indian coastline is the earth's most cyclone battered stretch of the world. Around 8 percent of the total land area in India is prone to cyclones. About two–third of the cyclones that occur in the Indian coastline occur in the Bay of Bengal. The states which are generally affected in the east coast are West–Bengal, Orissa, Andhra Pradesh, Tamil Nadu and on the west coast Gujarat, Maharashtra, Goa, Karnataka and Kerala.

Warning :

- Before any major damage is done, low pressure and the development can be seen for hours or days
- People are evacuated from places that are likely to be affected based on how these cyclones are moving as tracked by satellites. Accuracy is difficult to foresee
- Only a few hours' notice can be provided to the population at risk by accurate landfall predictions
- One of the best cyclone warning systems in the world is found in India. The nodal department for wind detection, tracking, and cyclone forecasting in India is the India Meteorological Department (IMD)
- Cyclone tracking is carried out using the INSAT satellite
- Cyclone warnings are broadcast using a variety of media, including radio, television, fax, high–priority telegrams, public announcements, and press bulletins. The general public, the fishing community, particularly those who fish in the sea, port authorities, commercial aviation, and government machinery are all informed of these warnings

Typical Adverse effects :

Major damage is done to dwellings and infrastructure during high winds, especially to flimsy buildings. In flat coastal areas, storm surge riding on tidal waves inundates the land over great distances, even up

to 15 kilometres inland. They are typically followed by heavy rainfall, floods, and storm surge.

Physical damage : Storm surge, floods, and wind speed will cause damage to or destruction of structures. Most structures' light–pitched roofs, especially those attached to industrial buildings, will sustain significant damage.

Casualties and public health : Viral outbreaks, diarrhoea, and malaria may be brought on by contaminated water supplies, which are brought on by flooding and flying contaminants.

Water supplies : Flood waters may affect surface and piped water supplies. Crops and food supplies are destroyed by strong winds and heavy rains that fall in low–lying locations. On agricultural land, salt from the sea may be deposited and raise salinity levels. A severe food scarcity could result from the crop's failure.

Communication Failure : Communication linkages may be severely disrupted by the wind, which also has the potential to bring down electrical towers, communication poles, telephone lines, antennas, satellite discs, and broadcasting services. Road and rail transportation networks could be reduced, Effective distribution of humanitarian supplies is hampered by improper.

MAJOR CYCLONES THAT STRUCK INDIAN AIRPORTS IN PAST

Cyclone 'PHYAN' (9–12 Nov 2009) at South India and Sri Lanka

- Cyclonic Storm Phyan developed as a tropical disturbance in the Arabian Sea to the southwest of Colombo in Sri Lanka on November 4, 2009 and made landfall in south India on November 7.
- Wind speeds of over 95Kmph
- High Alert was issued in states of Gujarat and Maharashtra as heavy rainfall of over 25 cm was expected.
- 'Phyan' affected Mumbai during 9–12 Nov 2009. It Crossed Maharashtra coast between Mumbai , Alibaug at 1530 IST on 11 November.
- Massive damage to property was reported in coastal districts of Maharashtra, such as Ratnagiri, Raigad, Sindhudurg, Thane and Palghar.

Cyclone 'Thane' (2011) – at Puducherry

- Cyclone Thane was the strongest tropical cyclone of 2011 within the North Indian Ocean.
- Thane became a very severe cyclonic storm on December 28, as it approached the Indian states of Tamil Nadu and Andhra Pradesh.
- Wind speeds of over 165kmph

- It made landfall at north Tamil Nadu coast between Cuddalore (60 kms from Puducherry) and Puducherry on December 30. At least 46 people died in Tamil Nadu and Puducherry.
- Cuddalore and Puducherry were the worst affected areas.
- Puducherry Airport remained closed from 30th Dec. 2011 to 2nd Jan. 2012.
- Thane caused severe damage at Puducherry airport. Roof of Old Terminal Building and ATC Tower was blown off. Also there was extensive damage to Fire Station and Perimeter Wall.

Cyclone 'Phailin' (11–13 October 2013) at Eatern India

- Cyclone Phailin hit Orissa's eastern coastal towns at speeds of more than 260 Km/hour, similar in strength of the 1999 super cyclone which killed more than 10,000 in the state.
- It made landfall near Gopalpur in Odisha coast, at around 2230 IST on October 12, 2013.
- An estimated million people were moved from their homes along the Orissa and Andhra Pradesh homes, many of them into temporary shelters.
- Though operations were closed for one day, there was not much damage at Bhubaneswar airport.

Cyclone 'Hudhud' (2014) at Vizag

- The cyclone has caused widespread damage to parts of Andhra Pradesh and Orissa states.
- Very severe cyclone Hudhud had killed 46 persons and injured 43 others.
- It affected 20.93 lakh families, took lives of 2831 animals and 24.43 lakh poultry/ducks in four districts on October 12.
- The winds and heavy rains have damaged power lines and buildings and prompted the evacuation of 350,000 people from their homes.
- Cyclone hit Vizag Airport on 12.10.2014. Impact was considerable and flight operation was stopped.
- Flight operations with minimal support started after five days, Full scale operations started after 10 days
- Approximately Rs. 12 Crores was spent for repair & restoration.

Vardha Cyclone at Chennai (12 December 2016)

- Chennai Airport was flooded, including the ATS complex and Nav Aids Buildings.
- Airport Operation was stopped from 0914 IST ON 12/12/2016. The flood trapped seventeen personnel (security guards on duty, staff at the remote substation, and CNS units near the runways) and they

had to climb up on top of buildings and watch–towers before they could be airlifted to safety the next day.

- Total Power failure occurred from 1515 IST to 2015 IST Airport Operations commenced at 0545 IST on 13/12/2016.

2.4 WATER DISASTER AFFECTING AVIATION SECTOR :

Disasters typically manifest themselves through water. Waterborne disease outbreaks, floods, landslides, tsunamis, storms, heat waves, cold snaps, and storms are all growing more common and powerful.

Hydro–hazards, often known as water–related hazards, are caused by intricate interactions between the ocean, atmosphere, and land processes. As a result of global warming, floods and droughts are anticipated to get worse. Increased event frequency and magnitude, unplanned urbanisation, deterioration of ecosystem services, susceptible livelihoods, and incorrect public perception of risk are only a few of the variables that contribute to increased hydro–hazard impacts and costs. The difficult part is figuring out

Floods :

Flooding occurs when the water level is high along a river channel or on the shore and causes land that is normally not submerged to be flooded. Floods can occur suddenly and without any prior notice as a result of embankment breaches, spill over, intense rain, etc. or they can develop gradually over hours or even days.

Causes of Floods :

- Heavy rainfall
- Heavy siltation of the river bed reduces the water carrying capacity of the rivers/stream.
- Blockages in the drains lead to flooding of the area.
- Landslides blocking the flow of the stream.
- Construction of dams and reservoirs
- In areas prone to cyclone, strong winds accompanied by heavy down pour along with storm surge leads to flooding.

MAJOR FLOODS THAT STRUCK INDIAN AIRPORTS IN PAST

Devastating Floods in Chennai (2 December 2015)

- Chennai received 490 mm of rainfall in 24 hours from 0830 IST on 1 December, 2015 due to North East monsoon.
- The problem was compounded after the Chembrabakkam reservoir was forced to release water into the Adyar River, adjacent to Chennai Airport.

- Due to the flooding, the airport was flooded & had to be shut down for flights from 2030 IST on 1 December 2015.
- The Airport resumed technical and ferry flights on Saturday, 5 December 2015.

Flood at Cochin International Airport (9 August 2018)

- Due to the incessant southwest monsoon rains, the upstream dams started overflowing and the water level in river Periyar which flows adjacent to Cochin airport started rising alarmingly.
- CIAL had to affect a suspension of all arrivals at 1300 IST on August 9, 2018 as a precautionary measure.
- Few other dams upstream had to be opened due to heavy rains which resulted in further flooding at the airport. Consequently, the airport remained closed till 29th August, 2018.
- DGCA carried out detailed inspection and the airport was cleared to resume operations from 1400hrs on August 29, 2018.

Indian Hazard Zones :

Nearly all of the country's river basins experience flooding. India has a flood–prone area of land of about 12% (40 million hectares). The majority of the flood–affected areas are located in the Ganga basin, the Brahmaputra basin (which includes the Barak, Tista, Torsa, Subansiri, Sankosh, Dihang, and Luhit), the northwest river basin (which includes the Jhelum, Chenab, Ravi, Sutlej, Beas, and the Ghagra), the peninsular river basin (which includes the Tapiti, Narmada, Mahanadi, Bai Among the states with a high risk of flooding are Assam, Uttar Pradesh, Bihar, and Orissa. 1200 mm of rain fall falls on our country each year, 85% of which falls in just 3 to 4 months, from June to September. The majority of the nation's rivers are fed with enormous amounts of water, much in excess of their carrying capacity, as a result of the country's intense and intermittent rain.

2.5 INDUSTRIAL HAZARDS AFFECTING AVIATION SECTOR :

Industrial hazard may be defined as any condition produced by industries that may cause injury or death to personnel or loss of product or property.

Types of Industrial hazards

1. Mechanical hazards
2. Electrical hazards
3. Chemical hazards
4. Fire hazards
5. Dust hazards

Mechanical Hazard : A mechanical risk involves a device or method. Air bags and automobiles both provide mechanical risks. Another type of mechanical hazard is compressed gases or liquids.

Causes of Mechanical Hazards :

- It occurs when a machine is malfunctioning.
- Machines may run either manually or automatically.
- A few machines are cutting, shearing, crushing, breaking.
- Most injuries occur when the machine needs human intervention repeatedly for its proper functioning.
- The machines are driven by a suitable power supply (electricity or steam).

Rudder Rx (Pittsburgh, US Airways Flight 427)

When US Airways Flight 427 began its approach to land in Pittsburgh on September 8, 1994, the Boeing 737 suddenly rolled to the left and plunged 5,000 feet to the ground, killing all 132 people onboard. The plane's black box revealed the rudder had abruptly moved to the full–left position, triggering the roll.

US Air blamed the plane. Boeing blamed the crew. It took nearly five years for the NTSB to conclude a jammed valve in the rudder–control system had caused the rudder to reverse: As the pilots frantically pressed on the right rudder pedal, the rudder went left.

As a result, Boeing spent $500 million to retrofit all 2,800 of the world's most popular jetliner. And, in response to conflicts between the airline and the victims' families, Congress passed the Aviation Disaster Family Assistance Act, which transferred survivor services to the NTSB.

Electrical Hazards : One of the typical electrical risks is shock. When an electric current flows through the body, it happens. When a person comes in contact with both the ground and a conductor carrying a current, this is feasible. Short Circuit is the term used to describe this.

Cause of Electrical Hazards :

Electrical risks can come from a variety of places, including short circuits, electrostatic risks, and explosive materials. A worker will experience shock if :

- Touches two wires with various voltages simultaneously.
- Squatting down and making contact with the phase
- Touches the phase having wet cloth and high humidity
- Get shocked by electrical components that are improperly grounded
- Touching someone who just got shocked by electricity

Electrical Spark Elimination (Long Island, TWA Flight 800)

It was everybody's worst nightmare: a plane that blew up in midair for no apparent reason. The July 17, 1996 explosion of TWA Flight 800, a Boeing 747 that had just taken off from JFK bound for Paris, killed all 230 people aboard and stirred great controversy.

After painstakingly reassembling the wreckage, the NTSB dismissed the possibility of a terrorist bomb or missile attack and concluded that fumes in the plane's nearly empty center–wing fuel tank had ignited, most likely after a short circuit in a wire bundle led to a spark in the fuel–gauge sensor.

The FAA has since mandated changes to reduce sparks from faulty wiring and other sources. Boeing, meanwhile, has developed a fuel–inerting system that injects nitrogen gas into fuel tanks to reduce the chance of explosions. It will install the system in all its newly built planes. Retrofit kits for in–service Boeings will also be available.

Chemical Hazards : These are structures where chemical mishaps may occur under specific conditions. Such occurrences might result in illness, injury, or incapacity for individuals. They can also result in fires, explosions, leaks, or releases of toxic or hazardous materials. The term "chemical accident" refers to an incident involving a fortuitous, unexpected, or unintended occurrence while handling any hazardous chemicals that results in continual, intermittent, or repeated exposure to death, injury, or damage to property. It excludes incidents caused solely by radioactivity or acts of war.

Causes of Chemical Hazards :

Vapours may be produced by solvents used in chemical analysis, synthetic drug purification, and extraction plants.

These gases or vapours could result in :

- Breathing problem and suffocation to worker
- Irritation or burn to eye or skin of the worker
- Liquid chemicals if spilled at workplace may produce

- Dehydration by strong dehydrating agents e.g. concentrated sulphuric acid
- Burning by strong acid or alkalis
- Oxidation by strong oxidizing agents
- Chemicals produced from different equipment may produce
- Some dusts may be carcinogenic (producing cancers)

Fire Hazards : Fire hazards are the workplace hazards that involve the presence of flame or risk of an uncontrolled fire.

Causes of Fire Hazards :

- Class A Fires: These are fires in ordinary combustible materials such as wood, cloth, paper etc. those produce glowing ember.
- Class B Fires: These are fires of flammable petroleum products, liquids, gases and greases etc.
- Class C Fires: These fires involve energized electrical equipment.
- Class D Fires: These are fires in combustible metals.

Fire prevention in the hold (Miami, ValuJet Flight 592)

Although the FAA took anti–cabin–fire measures after the 1983 Air Canada accident, it did nothing to protect passenger jet cargo compartments despite NTSB warnings after a 1988 cargo fire in which the plane managed to land safely. It took the horrific crash of ValuJet 592 into the Everglades near Miami on May 11, 1996 to finally spur the agency to action.

The fire in the DC–9 was caused by chemical oxygen generators that had been illegally packaged by SabreTech, the airline's maintenance contractor. A bump apparently set one off, and the resulting heat started a fire, which was fed by the oxygen being given off. The pilots were unable to land the burning plane in time, and 110 people died. The FAA responded by mandating smoke detectors and automatic fire extinguishers in the cargo holds of all commercial airliners. It also bolstered rules against carrying hazardous cargo on aircraft.

❑ **Check Your Progress :**

1. Nearly _____ of India is subject to one or more hazards.
   a. 65% b. 75% c. 85% d. 95%
2. Typhoon is the other names for _____
   a. Cyclones b. Hurricane
   c. Tornado d. None of the above options
3. _____ % of the total land in India is prone to cyclone.
   a. 5% b. 6% c. 7% d. 8%

4. IMD stands for _____
   a. Indian Meteorological Department
   b. International Meteorological Department
5. Which of the following are causes of floods ?
   a. Blockage in river drainage system
   b. Heavy silt in river reducing water carrying capacity
   c. Construction of dams and reserviours
   d. All of the above options
6. _____ % of total land is prone to flood in India
   a. 10% b. 11% c. 12% d. 13%
7. 66.66% of cyclone occurs in the Indian coastline occur in the _____
   a. Bay of Bengal b. Indian Ocean
   c. Arabian Sea d. None of the above options
8. Class B fires is _____
   a. Fire from combustible materials such as wood, cloth, paper, etc
   b. Fire from flammable material petroleum, liquids gases, gases, etc
   c. Fire from electrical equipment
   d. Fire from combustible metals

2.6 LET US SUM UP :

In this unit learners were made aware about the causes and impact of disaster on human being. Disasters can economically and socially break the individual from inside. It is important to know the causes of disaster in aviation industry so as to address them in future effectively.

Further in this unit lots of real life examples are quoted in the content to understand the cause and effect of disasters. Disaster caused by fire and chemical doesn't only harm aviation infrastructure but also put lot of stress in reconstruction.

2.7 ANSWERS FOR CHECK YOUR PROGRESS :

1. c **2.** a **3.** d **4.** a
5. d **6.** c **7.** a **8.** b

2.8 GLOSSARY :

Biological Hazard : Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro–organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Cyclone : A storm or system of winds that rotates about a center of low atmospheric pressure, advances at a speed of 20 to 30 miles (about 30 to 50 kilometers) an hour, and often brings heavy rain.

Hurricanes : A tropical cyclone with winds of 74 miles (119 kilometers) per hour or greater that is usually accompanied by rain, thunder, and lightning, and that sometimes moves into temperate latitudes.

Prevention : The outright avoidance of adverse impacts of hazards and related disasters.

Technological Hazard : A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Typhoons : A hurricane occurring especially in the region of the Philippines or the China Sea is called as typhoon.

2.9 ASSIGNMENT :

1. What are the different types of wind disaster and affect of wind disaster on the airports ?
2. How dangerous is electrical and chemical hazards at airport ? Report any real time incident of electrical or chemical hazard happened at airport.

2.10 ACTIVITIES :

1. Estimate the social and economic effect of cyclone as a disaster on common people.
2. Enlist the aviation disaster in India from 1950s till now.

2.11 CASE STUDY :

Case Study: China Airlines Flight 140 (1994)

China Airlines Flight 140 regularly flew between Taipei's Chiang Kai–shek International Airport, in Taiwan, and Nagoya's Nagoya Airport, Japan. Unfortunately, the flight on 26th April 1994 turned out to be anything but routine when the First Officer on board inadvertently activated the TO/GA or Takeoff/Go–around button shortly before the Airbus A300B4–622R was to land at Nagoya. This button changes throttle position to that required for take offs and go–around. The pilots tried to correct the situation, but autopilot thwarted their efforts, as it is supposed to during TO/GA activation. The plane pitched sharply and decreasing airspeed resulted in a stall. The plane subsequently crashed killing 264 of the 271 people aboard. It remains the worst aviation accident for China Airlines and the second–worst on Japanese soil.

In case you are now filled with trepidation and anxiety about your next flight, you can breathe easy. Just 2 out these 10 disasters occurred in the last decade and this in itself should be a good indicator of flight safety today. While the human cost from such air crashes can never be measured, don't forget that each of these unfortunate incidents led to improvements in aviation technology and safety, making air travel safer for all of us today.

Questions :

1. Discuss the role of autopilot and Artificial Intelligence in the aviation sector.

2.12 FURTHER READING :

1. Disaster Management (2021), A.K. Srivastava, Scientific Publishers (India)
2. Disaster Management: Enabling Resilience (2014), Anthony Masys, Springer Nature
3. Disaster Management, R. Subramanian, Vikas Publishing House

UNIT 03 Role of Different Disaster Management Organisations

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- To provide insight about the various organisation for disaster management
- To make learners aware about the Disaster Management Act

3.1 INTRODUCTION :

Disasters hinder progress and undo the hardwork. frequently sets the country's desire for advancement, back by several decades. More focus has been placed on effective disaster management than just reaction to their occurrence. India is susceptible to a wide range of natural and man–made calamities to varied degrees. A moderate to extremely high strength earthquake might occur anywhere on 59% of the planet. Floods and river erosion threaten almost 40 million hectares of land, or 12% of the total area. Out of 7516 km of coastline, 5700 km are vulnerable to hurricanes and tsunamis. A land slip risk exists in hilly locations and in 68% of cultivable land.

There is also a possibility of disasters and catastrophes with chemical, biological, or nuclear origins. Development in high–risk areas, fast urbanisation, industrialization, environmental degradation, and climate change are all factors that might increase the likelihood of a disaster.

The Disaster Management Act, a national policy passed in 2005, calls for capacity building on numerous disaster management topics at various levels. It consists of measures for catastrophe mitigation, reaction, preparation, and reconstruction.

Including its diverse geological, meteorological, and geographic circumstances, India is vulnerable to a variety of disasters. 5700 km out of 7516 km stretch of coastline is vulnerable to cyclones and tsunamis, while 40 million hectares (12%) of land are at risk of flooding and river erosion, 58% of the land is vulnerable to earthquakes, and 68% of cultivable land is susceptible to drought due to the lack of river water. Landslides are possible in all hilly places. The usage of fossil fuels for the majority of energy producing activities and transportation also contributes to environmental degradation through the abnormal release of greenhouse gases into the atmosphere. Bases for risk reductions include:

- Planning in advance
- Robust design methodology, to withstand higher level of risk and technological adoption such as tsunami warning system and Polari metric radar.
- Implementing it in right time to reduce risk
- Ensuring safety and security in case of disaster in separate incident or in a combination of multiple disasters.

(Dr. A.P.J. Abdul Kalam)

After the earthquake in Bhuj in 2001 and the tsunami in 2004, disaster management is a hot topic. The Government of India has put a tsunami and storm surge warning system in place. Using satellite remote sensing data, studies on Tsunami vulnerability, climatic disaster resilience index, drought assessment, and coastal chronic catastrophes including shoreline erosion were conducted over the past ten years. The introduction of Disaster Management to the curriculum of Higher education has benefited Asian universities. It sought to offer training, education, and capacity building for disasters.

3.2 ROLE OF AAI & DGCA IN DISASTER MANAGEMENT :

The Airports Authority of India (AAI) is a non–listed Statutory Corporation created by the Airports Authority of India (AAI), 1994 (the Act), which is fully owned by the Indian Government. In India, it is the top airport manager and the only company offering air navigation services. Airports, including international and domestic airports, are owned and maintained by lt.

The delicate and crucial element of air travel is safety. According to AAI's mission objectives, AAI's mission is to serve as the cornerstone of an enduring Indian aviation network by offering high–quality, secure, and customer–focused airport and air navigation services and consequently serving as a driver for economic growth in the regions they serve. The following are some of its disaster management functions:

- Disaster Management Plans (DMPs) are created by AAI for all of our airports that adhere to GoI regulations
- According to the Disaster Management Act of 2005, the Disaster Management Plan is in accordance with the NDMA (National Disaster Management Policy, 2009, and National Disaster Management Plan, 2016).
- It is responsibility of AAI to get DMP approved from respective District/State Disaster Management Authority
- AAI also get the emergency response and recovery tools deployed at significant airports
- Human life detector, victim location camera, thermal imaging camera, air lifting bag, portable generator, life jackets and buoys, safety lamp, portable shelters, etc

Accidents and accidents occur at airports or when the plane is in flight. There are several potential causes, including runway incursion or excursion, poor weather, malfunction of a crucial system component, breakage of ground contact, and many more. The authorities carry out their inquiry in accordance with international standards by travelling to the scene, gathering important data there, and obtaining the aircraft's black box. The investigation's main goal is to identify the cause and prevent a future recurrence of the incident or disaster. Until May 2012, the Directorate General of Civil Aviation (DGCA) in India conducted investigations into such events. Since that time, the investigation duties have been handled by the Aircraft Accident Investigation Bureau (AAIB).

3.3 NATIONAL AUTHORITY :

The Act mandates the creation of the National Disaster Management Authority (NDMA), whose chairman shall be the Prime Minister of India. There can only be nine members total on the NDMA, including the Vice–Chairperson. Members of the NDMA have a five–year term limit. The NDMA, which was first created on May 30, 2005, by presidential order, was established on September 27, 2006, in accordance with Section 3(1) of the Disaster Management Act. The NDMA is in charge of "establishing the policies, plans, and procedures for disaster management" and of making sure that "timely and effective response to disaster" is provided. It is tasked with establishing "guidelines to be followed by the State Authorities in drawing up the State Plans" in accordance with Section 6 of the Act.

National Disaster Management Authority has been constituted with the Prime Minister of India as its Chairman, a Vice Chairman with the status of Cabinet Minister, and eight members with the status of Ministers of State.

Functions and Responsibilities :

In order to provide a prompt and efficient response to disasters, the NDMA, as the top body, is tasked with establishing the policies, strategies, and guidelines for disaster management. It is accountable for the following in order to achieve this:

- Lay down policies on disaster management;
- Approves the National Plan;
- Approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;
- Lay down guidelines to be followed by the State Authorities in drawing up the State Plan;
- Lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;
- Coordinate the enforcement and implementation of the policy and plans for disaster management;
- Recommend provision of funds for the purpose of mitigation;
- Provide such support to other countries affected by major disasters as may be determined by the Central Government;
- Take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with threatening disaster situations or disasters as it may consider necessary;
- Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

The NDMA also provides other government representatives, organisations, and the general public with equipment and training in disaster preparedness and response. For capacity building, it collaborates closely with the National Institute of Disaster Management. It creates procedures, provides practical instruction, and plans disaster management drills. At the state and local levels, it also provides equipment and training for disaster management cells.

The Ministry of Home Affairs' NDMA has the authority to be charged with protecting important cyber infrastructure.

3.4 NATIONAL EXECUTIVE COMMITTEE :

The National Executive Committee (NEC) must be established by the Central Government in accordance with Section 8 of the Act in order to support the National Authority. The Home Secretary serves as Chairperson, ex officio, and the NEC is made up of Secretary level officers from the Ministries of Home, Agriculture, Atomic Energy, Defence, Drinking Water Supply, Environment and Forests, Finance (Expenditure), Health, Power, Rural Development, Science and Technology, Space,

Telecommunication, Urban Development, and Water Resources. Ex officio member of the NEC is the Chief of the Integrated Defense Staff of the Chiefs of Staff Committee. According to the Act's provision, the NEC is in charge of creating the National Disaster Management Plan for the entire nation and making sure it is "examined and updated annually."

Sub–Committees :

According to Section 9(1) of the Disaster Management (DM) Act 2005, the National Executive Committee (NEC) may establish one or more subcommittees as and when necessary to effectively carry out its duties. The subcommittee's chair will be chosen by the NEC from among its members, and anyone working as an expert on the committee will get the allowances that the Central Government has set forth.

Accordingly, the NEC authorised the formation of the following subcommittees to carry out its duties of reviewing reports from the Inter–Ministerial Central Team (IMCT):

A. It is for the benefit of the NEC, the subcommittee led by the Home Secretary will review IMCT reports on cyclones, fires, floods, earthquakes, landslides, avalanches, tsunamis, and cloudbursts. The Ministry of Home Affairs' Secretary for Border Management, as well as Secretaries for the following departments: Drinking Water Supply, Expenditure (Ministry of Finance), Food and Public Distribution, Health, Ministry of Housing and Urban Poverty Alleviation, Ministry of Petroleum and Natural Gas, Planning Commission, Ministry of Power, Ministry of Road Transport, and Highway.

B. The subcommittee, which is chaired by the secretary of agriculture and cooperation, will review IMCT reports on droughts, hailstorms, insect infestations, cold waves, and frost. The members of the subcommittee will be the secretaries of the following departments: drinking water supply, expenditure (Ministry of Finance), food and public distribution, planning commission, ministry of power, rural development, ministry of water resources, Secretary (BM) of the Ministry of Home Affairs, and joint secretary (drought management) of the Department of Agriculture & Cooperation.

According to Section 42 (2) of the DM Act, 2005, these subcommittees will act on behalf of the NEC and decide the scope of assistance and expenditures that can be paid for from the National Disaster Response Fund (NDRF) and State Disaster Response Fund (SDRF). The High–Level Committee will be presented with these committees' recommendations in order to decide how much funding will come from the NDRF.

3.5 STATE DISASTER MANAGEMENT AUTHORITY :

All State Governments are mandated under Section 14 of the act to establish a State Disaster Management Authority (SDMA). The SDMA consists of the Chief Minister of the State, who is the Chairperson, and

no more than eight members appointed by the Chief Minister. State Executive Committee is responsible (Section 22) for drawing up the state disaster management plan, and implementing the National Plan. The SDMA is mandated under section 28 to ensure that all the departments of the State prepare disaster management plans as prescribed by the National and State Authorities.

A comprehensive and integrated approach to disaster management in India would be led and implemented by State Disaster Management Authorities (SDMAs) under the respective Chief Ministers.

Roles and Responsibilities :

The State Authority must establish specific criteria for providing standards of assistance to those in the State who have been impacted by disasters, but these guidelines must always meet the minimum requirements set forth by the National Authority.

The State Act further stipulates that the State shall have a State Executive Committee (SEC). To assist the SDMA in carrying out the duties outlined in the SDMA Act, the SEC is additionally informed by the Chief Secretary (Head of SEC) and other members as members. The executive branch of the SDMA is the SEC. The State Executive Committee (SEC) is required to carry out specific duties under the SDMA Act. The SDMA and SEC are jointly responsible for the following tasks:

Key Functions Expected :

- Development of awareness campaign strategy and its implementation in the state.
- Development of Human Resource Plan for implementation thereof – development of training modules and material
- Preparation or updation of state disaster management plan to ensure that the issues of DRR have been addressed
- To initiating risk and vulnerability assessments and preparation of annual vulnerability and risk reduction reports.
- Laying down guidelines to integrate DRR into development process
- Follow up with various line departments to ensure that DRR issues have been addressed in their development plans.
- Preparation of Disaster Risk Reduction Projects in various sectors.
- Carrying out DRR Audit of the development plans prepared by line departments.
- Developing a Recovery framework for the state.
- Development of Knowledge and information sharing platform in DRR
- Conceptualizing and formulating projects and programmes as a part of the national initiatives/schemes.
- Preparation of Minimum Standards of Relief

- Preparation of Disaster Management Policy
- Preparation of Mitigation plans vis a vis various hazards
- Coordinate and monitor the implementation of National Policy, National Plan and State Plan
- Lay down guidelines for the preparation of DMP by various departments
- Lay down guidelines for safe construction practices and ensure compliance thereof
- Provide necessary technical assistance or give advice to District Authorities.
- Lay down, review and update state level response plans and guidelines
- Ensuring the communication system is in order – setting up and strengthening of EOCs
- Ensuring the conduct of mock drills regularly

3.6 DISTRICT DISASTER MANAGEMENT AUTHORITY :

The Collector, District Magistrate, or Deputy Commissioner of the district will serve as the chairman of the District Disaster Management Authority (DDMA). The area's elected representative serves as the DDMA's ex officio Co–Chairperson (Section 25).

District Disaster Management Authority's Powers and Functions :

In accordance with Section 34 of the Disaster Management Act, the District Authority may take the following actions in response to any imminent disaster situation or Disaster in order to aid, protect, or provide assistance to the community:

a. Give directions for the release and use of resources available with any Department of the Government and the local authority in the district;

b. Control and restrict vehicular traffic to, from and within, the vulnerable or affected area;

c. Control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area;

d. Remove debris, conduct search and carry out rescue operations;

e. Provide shelter, food, drinking water and essential provisions, healthcare and services;

f. Establish emergency communication systems in the affected area;

g. Make arrangements for the disposal of the unclaimed dead bodies;

h. Recommend to any Department of the Government of the State or any authority or body under that Government at the district level to take such measures as are necessary in its opinion;

i. Require experts and consultants in the relevant fields to advise and assist as it may deem necessary;

j. Procure exclusive or preferential use of amenities from any authority or person;

k. Construct temporary bridges or other necessary structures and demolish structures which may be hazardous to public or aggravate the effects of the disaster; Ensure that the non–governmental organizations carry out their activities in an equitable and non discriminatory manner;

l. Ensure that the non–governmental organizations carry out their activities in an equitable and non–discriminatory manner;

m. Take such other steps as may be required or warranted to be taken in such a situation.

3.7 NATIONAL DISASTER RESPONSE FORCE (NDRF) :

A National Disaster Reaction Force will be established, according to Sections 44 and 45 of the Act, "for the purpose of specialist response to a threatening disaster scenario or disaster." The Director General will be chosen by the Central Government. Recently, during the September 2014 Kashmir floods, the NDRF was recognised by the Indian government for their crucial contribution to the rescue of tourists and members of the armed forces.

In India, the State Government is in charge of disaster management. The Ministry of Home Affairs is the central government's "Nodal Ministry" for Managing Natural Disasters (MHA).

The Central Government is in charge of providing aid and assistance to the affected state in the event of "calamities of severe nature," including the deployment, at the State's request, of Armed Forces, Central Paramilitary Forces, the National Disaster Response Force (NDRF), and any other communication, air, and other assets that are available and required.

The National Disaster Management Authority oversees the National Disaster Response Force (NDRF). Director General is the title given to the leader of the NDRF. The Director Generals of NDRF are officers from Indian police agencies on deputation with the IPS. A three–star officer is the director general.

The NDRF is a top–heavy institution, with multiple Inspector Generals (IG) and Deputy IGs who are flag officers and wear rank badges in addition to the Director General.

Functional Parameters :

The National Disaster Management Authority's mission is to create a safer and more disaster–resilient India through the creation of a comprehensive, pro–active, multi–disaster, and technology–driven disaster management plan. This must be accomplished through the development of a culture of disaster preparedness, mitigation, and prevention in order to provide a quick and effective response. This national vision seeks, among other things, to instil a readiness culture among all stakeholders.

By conducting highly skilled rescue and relief operations, regular and intensive training and re–training, familiarisation exercises within the respective NDRF Battalions' areas of responsibility, and conducting mock drills and joint exercises with the various stakeholders, the NDRF has demonstrated its significance in achieving this vision.

3.8 DISASTER MANAGEMENT ACT :

The Rajya Sabha, the upper house of the Indian Parliament, enacted the Disaster Management Act, 2005, (23 December 2005) No. 53 of 2005, and the Lok Sabha, the lower house of the Parliament, did the same on 12 December 2005. On January 9, 2006, The President of India gave his approval. There are 79 Parts and 11 Chapters in the Disaster Management Act, 2005. The Act applies to all of India. The Act addresses "matters associated thereto or incidental thereto, as well as the appropriate management of disasters."

Other Provisions :

Section 42 of the Disaster Management Act calls for establishing a National Institute of Disaster Management. A multitude of amounts of cash are required for disaster mitigation under Section 46–50. Anyone who violates an Act requirement is subject to both civil and criminal penalties.

Implementation :

The National Disaster Act of 2005 has been slowly and slackly implemented. The governments of Uttarakhand, Tamil Nadu, Odisha, Andhra Pradesh, Gujarat, Rajasthan, Maharashtra, and the Central government were given notifications on July 22, 2013, for allegedly failing to implement the Disaster Management Act, 2005, in response to a Public Interest Litigation. The petitioner claimed that citizens' lives were at danger because the government of Uttarakhand was not putting the Disaster Management Act into practise. According to the Disaster Management Act, he requested "reasonable ex–gratia assistance on account of loss of life, damage to homes, and for restoration of means of livelihood to victims of flash floods in Uttarakhand."

Criticism of the Act :

The act has drawn criticism for marginalising non–governmental organisations (NGOs), locally elected officials, local communities, and civic organisations. It has also been criticised for encouraging a hierarchical, bureaucratic, command and control, or "top down," approach that gives the federal, state, and local governments broad authority. The "Act became a law almost at the will of the bureaucrats who framed it," it is further alleged. Governments' economic progress has been negatively impacted by disasters, which have severely damaged both people and property. To lessen the negative effects of calamity, disaster management must be proactive, all–encompassing, and ongoing.

Due to its particular Geo–climatic characteristics, India has historically been susceptible to natural disasters such floods, droughts, cyclones, earthquakes, and landslides. A 60% of the world's landmass is vulnerable to earthquakes of varying magnitudes. Floods can occur over more than 40 million hectares. 68% of the land is at risk for drought, and 8% of the area is vulnerable to cyclones. Annually, disasters affect over 30 million individuals. The 1990–2000 decade was designated as the "International Decade for Natural Disaster Reduction" by the United Nations General Assembly in 1989 with the goal of limiting socioeconomic damage and reducing loss of life through coordinated international action in developing nations. The Super Cyclone that struck Orissa in 1999 and the Bhuj earthquake that struck Gujarat in 2001 highlighted the necessity of implementing a multidimensional scientific, engineering, financial, and social approach. A paradigm shift in the approach to disaster management has been brought about by the GOI. This strategy is based on the conviction that catastrophe mitigation must be incorporated into the development process for development to be sustainable. Mitigation must involve all areas of development and be multidisciplinary. A National Disaster Framework that includes institutional processes, a disaster prevention strategy, an early warning system, disaster mitigation, preparedness and response, and human resource development has been developed using the approach.

All state governments and the administrations of the union territories have been given access to this disaster framework. Government of India Ministries and Departments, as well as State Government administrations, have been instructed to create their own frameworks using the national framework as a general framework. In order to put institutional and regulatory framework in place, disaster management demands a multidisciplinary and proactive approach. Our goal is to make communities less vulnerable to all kinds of disaster. The planning commission's advice serves as the foundation for relief expenses associated to natural disasters. Understand the disaster management budget for the next five years. The recommendations of a series of finance commissioners serve as the foundation for natural disaster relief spending. The Calamity Relief Fund is intended to cover the costs associated with giving emergency aid to those affected by hurricanes, droughts, earthquakes, fires, floods, and hailstorms. Restoration costs for damaged capital projects were covered by regular budgetary heads. The state government contributes the remaining 25% of the overall annual allocation, with the GOI contributing 75% of it in the form of a non–plan grant.

The state governments must fully utilise the current plan schemes and prioritise the implementation of those that will aid in overcoming the conditions brought on by the disaster. Each state must assemble a group, hire qualified individuals, set aside funds for specialised tools, establish an effective communication system, and create a useful, clever database that is simple to use. Disaster management refers to a continuous

and integrated process of organising, coordinating, and putting into action measures that are necessary or expedient for danger prevention, reducing the risk of any disaster or its severity or consequences, building capacity, being ready to deal with any disaster, responding quickly to any threatening disaster, and assessing the severity or magnitude of effects. According to policy, State governments are in charge of disaster management, including prevention and mitigation, while the GOI offers assistance as needed in accordance with the standards established from time to time. The policy's board goal is to reduce the number of lives lost and damage to social, private, and community assets as a result of natural or man–made disasters, as well as to promote sustainable development and higher living conditions for everybody.

The States are encouraged to pass disaster management legislation. These laws give authorities the necessary authority to coordinate mitigation, preparedness, and response efforts as well as the necessary mitigation and prevention actions. Following the issuance of the notification required by subsection (1) of section 3, each State government creates a State disaster management authority for the state with a name that may be specified in the notification. Create an advisory committee when it is deemed necessary, with members who are specialists in the field of disaster management and have firsthand knowledge of the subject. This group will give recommendations on various disaster management–related topics. With the responsibility of looking at the entire disaster management cycle, including prevention, mitigation, preparedness, response, relief rehabilitation, steps for prevention, mitigation will need to be taken across a number of departments, the state department of relief and rehabilitation may be transformed into a department of disaster management. The various government departments' actions will be coordinated by the disaster management department.

❑ **Check Your Progress :**

1. The infamous earthquake in Bhuj occurred in _____

   a. 2000 b. 2001 c. 2002 d. 2003

2. Airport Authority of India came into existence in _____

   a. 1991 b. 1992 c. 1993 d. 1994

3. Disaster Management Act cane into existence in _____

   a. 2001 b. 2003 c. 2005 d. 2007

4. The _____ use to investigate air disaster prior to Aircraft Accident Investigation.

   a. AAI b. DGCA

   c. Both a and b d. None of the above options

5. Under Section _____ of State Government are mandate to establish State Disaster Management Authority (SDMA).

   a. 12 b. 13 c. 14 d. 15

6. According to section 44 & 45 _____ disaster management organisation was established.

   a. NDRF b. DDMA c. SDMA d. SDRF

7. There are _____ Parts and _____ Chapters in Disaster Management Act.

   a. 77 & 9 b. 78 & 10 c. 79 & 11 d. 80 & 12

8. The contribution by State Government in restoration cost is _____

   a. 25% b. 75% c. 33% d. 67%

3.9 LET US SUM UP :

National Disaster Manager Authority (NDMA) operates the National Disaster Management Operations Centre, which is outfitted with cutting–edge redundant and resilient communication technologies. The NDMA is also responsible for capacity building, training, and knowledge management. Building a functional and operational infrastructure that is suitable for disaster management with unknowns and intended plans of action.

The nation currently, however, has a national vision that aims to create a safe and disaster–resilient India by building a holistic, proactive, multi–disaster, and technology–driven strategy for Disaster Management. This will be accomplished through fostering a culture of disaster preparedness and response that emphasises preventive, mitigation, and preparedness. The combined efforts of all governmental and non–governmental organisations will place the community at the centre of the entire process and provide it energy and vitality.

This unit covers in depth the functions and roles of the NDRF, NDMA, SDMA, and NEC as well as the role of AAI in disaster management.

3.10 ANSWERS FOR CHECK YOUR PROGRESS :

1. b	**2.** d	**3.** c	**4.** d
5. c	**6.** a	**7.** c	**8.** a

3.11 GLOSSARY :

Catastrophes : An event causing great and usually sudden damage or suffering.

Civil Aviation : Flights and aircraft used for personal and business purposes, such as transporting goods or passengers, rather than for military purposes.

Disaster Mitigation : Sustained action that reduces or eliminates long–term risk to people and property from natural hazards and their effects.

Geo–Climatic Hazards : These are natural phenomena that occur by a combination of atmospheric (e.g. precipitation, temperature, wind) and terrain (geotechnical and morphometric properties) factors.

Preparedness : It consists of a set of measures undertaken in advance by governments, organisations, communities, or individuals to better respond and cope with the immediate aftermath of a disaster, whether it be human–induced or caused by natural hazards.

3.12 ASSIGNMENT :

1. What is the role of NDRF in disaster management in India ?
2. Write a detailed note on Disaster Management Act.

3.13 ACTIVITIES :

1. Explain the working of National Disaster Management using any past example of rescue.
2. Study the work done by AAI in minimising the damage to the airport property in the event of any disaster.

3.14 CASE STUDY :

Case Study of the Indian Aviation Sector: Soaring High or Turbulence Ahead

Takeoff from Modest Beginnings : The Evolution of the Indian Aviation Sector

The Indian Aviation sector is poised to take off and soar high in an unprecedented manner. Indeed, the Aviation sector in India has come a long way from the humble beginnings in the pre–independence era where the legendary JRD Tata, pioneered the industry and introduced a small turboprop plane as the first connection to the outside world by air.

Now, the Aviation sector is a stage where it boasts of world–class airports, best in the breed airlines, and an enviable safety record, though minor skirmishes are reported often. From being a preserve of the rich to the present where the AamAdmi is the focus of the airline industry, the aviation sector mirrors the development and evolution of the Indian Economy over the decades.

Added to this is the fact that successive Indian Governments since the 1990s when the Indian Economy was liberalized have actively encouraged the development of the sector by providing subsidies and establishing world–class airports, though at a tardy pace given the inherent complexities of the Indian political and socioeconomic landscape.

Thus, it can be said that the Indian Aviation sector is both poised to take off as far as the future is concerned and is soaring high as far as the present is concerned.

Factors Dragging the Sector Down

Having said that, there are a few bottlenecks or chokepoints that have stymied the development and the growth of the Indian Aviation Sector. Prominent among these is the capacity addition in the airports across India where the present infrastructure is unable to support the ambitious expansion plans of the various airlines.

Indeed, even after building gleaming and glittering airports in all the Metros under the PPP or the Public Private Partnership model, airlines are routinely denied landing rights and parking bays for want of capacity.

Further, the fact that the blistering pace of growth in the sector means that despite adding capacity in a quick manner, airports are unable to handle the ever–increasing load of footfalls in terms of arrivals and departures.

Though the Indian Government has put in place policies such as the UDAAN Scheme, the Regional Connectivity Scheme, and various others aimed at persuading and incentivizing airlines to connect to remote locations, the pathetic state of the infrastructure in such areas means that such schemes would take time to fructify. Of course, the massive push to develop Tier 2 and Tier 3 airports is clearly a right step in the direction of broadening the base of the infrastructure pyramid so that flyers from rural areas can benefit as well.

However, this push is succeeding in states where the state governments are actively encouraging such developments whereas in other regions, the initiative is lagging the former.

How the Indian Aviation Sector Became World Class

Having said that, it is also the case that the crowning glory of the Indian Aviation sector lies in the dirt cheap prices that are offered to the passengers and which are among the lowest in the world as far as LCC or Low Cost Carriers are concerned.

Talking about LCCs, the Indian Aviation sector was among the first in the developing world to take the LCC route with CaptGopinath launching Deccan Aviation or Air Deccan which had the logo of the famous cartoonist, RK Lakshman's common man flying.

Though it is another matter that Air Deccan was acquired by the now defunct Kingfisher airlines, whose high flying promoter, Vijay Mallya, went bankrupt a few years ago, the fact remains that the LCC concept caught on among other airlines s well.

Talking about the personalities and the airlines that have dominated the Indian Aviation sector, it is the case that most of the Airlines which took advantage of the liberalized Indian Economy in the 1990s were essentially one person shows meaning that the promoters or the CEOs often had a larger than life presence.

Indeed, people such as Mallya, NareshGoyal of Jet Airways, the promoters of Spicejet, and others straddled the scene. However, many Industry experts have pointed out that the Indian Aviation sector can be more professionally managed as far as both airport and airline management is concerned.

Already, a start has been made here with the construction of the modern airports in Bengaluru, Mumbai, Delhi, and Hyderabad by a consortium of Indian and Foreign players. Also, airlines such as Indigo are professionally managed without personality cults or run by the whims and fancies of a single individual.

Moreover, with the reentry of the venerable TATA group through tie–ups and partnerships, the Indian Aviation sector looks to be on its way to First World status.

Cautious Optimism Instead of Hyped Hope

As the title of this case study indicates, what the future holds for the Indian Aviation Sector can be characterized as cautious optimism instead of unrealized hopes. For instance, the growth in the passenger traffic has been dizzying over the last few years.

Further, the increase in the number of airlines and the concomitant capacity addition in terms of infrastructure and airports built has also been high. Thus, there is scope for ambition, though it has to be tempered with realism.

This is mainly on account of the various problems besetting the Indian Aviation Sector such as overcrowding both in terms of handling arrivals and departures in the airports as well as the very real problem of flights having to wait inordinately for landings and takeoffs. Indeed, despite the capacity addition, except for New Delhi and Mumbai International Airports, no other airport in India has two runways.

Even in these airports, sometimes the number of arrivals and departures are so high that despite the two runways, aircraft have to wait to take off and land. This compares poorly with the major airports in the world where it is routine for air traffic controllers or ATCs to handle hundreds of aircraft movements each hour. Indeed, if India aspires to join the ranks of developed countries, there can be no better way to do so than by showcasing its Aviation Sector.

From Ambani to AamAdmi: How the Indian Aviation Sector became Egalitarian

Talking about the last point, the Indian Aviation Sector has long been a study in contrast where the predominantly poor India meets the glitzy and emerging as well as arriving (literally and metaphorically) India. This has led to frequent criticism by those who point to the anomaly and contradiction of a poor country investing in its airports when the money can instead be used to better the lives of the poor.

Indeed, this was the reason why the Indian Aviation Sector did not takeoff during the 1970s and the 1980s when the dominant ideology was socialism.

As with many things that happened after the liberalization of the Indian Economy in the 1990s, the Aviation Sector too took wings and began to soar high. However, even in the 1990s and the early 2000s, there were many rules and regulations that stymied the growth of the sector as well as stunted the development of the same.

Indeed, it was not until a few years ago that the Indian Government permitted international tie–ups and it was only recently that the permission for domestic airlines to fly to international destinations was accorded. Thus, it can be said that it is only now that the Indian Aviation Sector can dream of soaring high.

Turbulence Ahead

Having said that, it is also the case that safety standards seem to be lax these days as evidenced b the number of aircrafts reporting defects and botched takeoffs and landings. While it is true that the Indian Aviation Sector does not have any major accidents as a blot on its operations, it is always better to be safe than sorry and hence, it is time for the regulators and other stakeholders to take passenger safety seriously.

What is also worrying is the casual attitude towards passengers especially when they are boarding or deplaning. Indeed, while the Indian Media does tend to sensationalize the incidents, the repeated instances of airline crew and staff being rude to the passengers and worse, becoming violent with them does not any good to the Image of the Indian Aviation Sector.

Moreover, the way in which the long queues at the booking counters and the security checkpoints tend to become irritating and indeed, painful for the passengers does not bode well for the future of the Indian Aviation Sector. It is for these reasons that we believe that there can be turbulence ahead for the sector.

Premier to Poor: The Air India Saga

No case study on the Indian Aviation Sector is complete without a discussion on the national carrier, Air India, the merged entity representing the erstwhile Air India and Indian Airlines, the domestic carrier.

While it is now routine for commentators to lampoon Air India, it needs to be remembered that it was the premier Indian carrier in the post Independence era until the liberalization of the Indian Economy.

Having said that, the wheel has come full circle and hence, its present status as a loss–making entity that is depending on governmental bailouts to stay afloat means that perhaps it is time to privatize it.

Indeed, its portfolio of landing rights and code share agreements as well as its fleet, though ageing, makes it attractive to foreign and

domestic players alike who can convert these advantages into their own and at the same time, restructure it in such a manner that it becomes possible for it to become profitable again.

Thus, it needs to be watched as to what decision the political masters take in this regard. It can be said that politics plays a major role in determining the fate of Air India since there is the aspect of emotional and sentimental reasons as well.

Impact of Politics on the Indian Aviation Sector

Talking about politics and the future of the Indian Aviation Sector, it needs to be mentioned that the sector has grown with and without political interference. In other words, while in some cases, the political decisions helped the sector, in other cases, it grew despite the politicians meddling with it.

Indeed, in all cases, the sector has grown to live with both the adverse and the beneficial political decisions. For instance, a long pending demand of the sector has been to lower the high prices for Aviation and Turbine fuel.

In times when oil prices are at record lows, it makes sense for the government to cut the prices of ATF or Aviation Turbine Fuel. However, this has not happened and hence, airlines continue to grumble and at the same time, carry on with their operations.

Also, capacity addition and more landing rights are to be dealt with as well. On a more controversial note, the bilateral agreements between the Indian and the Foreign Governments about seat allocations or the number of passengers flying to and fro between Indian and Foreign Destinations seems to be taken with a view to favor some airlines over others.

Conclusion

It goes without saying that there are some measures that would minimize the path ahead for the sector. To start with, the present agreement on not having two airports within 150 Kilometers of each other can be reviewed especially where Bangalore and Hyderabad are concerned.

In both these cities, the airports in operation earlier have been mothballed despite massive investments in them mainly because the new airports and their owners specified the agreement on distance.

By reopening the old airports, significant capacity can be added thereby both lessening the load on the new airports as well as furthering the growth. To conclude, it can be said that it is a mixed bag as far as the Indian Aviation Sector is concerned wherein it is soaring high but also faces turbulence ahead.

Questions :

1. What are the factors leading the growth in Indian aviation sector ?
2. Discuss the barrier in the aviation sector stopping the airlines to perform at optimal level.
3. What went wrong to Air India when it was under central government control ?

3.14 FURTHER READING :

1. Disaster Management: Text and Case Studies (2007), D.B.N. Murthy, Deep & Deep Publications
2. Textbook of Disaster Management (2013), Dr Nitesh Kumar, Satish Serial Publishing House
3. Disaster Management (2021), A.K. Srivastava, Scientific Publishers (India)

BLOCK SUMMARY

The study and practise of hazard management in aviation is known as aviation disaster management. This covers things like research, educating people involved in air travel, passengers, and the general public, as well as improving aircraft and aviation infrastructure. There is a lot of regulation and supervision of the aviation sector. Instead of concentrating on inadvertent accidents, aviation security focuses on preventing purposeful injury or disruption to passengers, planes, and infrastructure. The aviation industry is subject to both natural and man–made risks for this lot of efforts must be made to manage these disasters..

Basic disaster–related information and terminology have been discussed to introduce the topic in this block. The effects of disaster on ordinary people were also made clear to the students. In this block, different organisations associated to disaster management were also discussed. To gain a better understanding of the situation, the organization's role, duty, and functions were communicated to the learners.

BLOCK ASSIGNMENT

■ **Short Question Answer :**

1. Define the tern disaster.
2. Differentiate between natural and man–made disaster.
3. Explain the term Resilience.
4. What are the direct losses due to disaster ?
5. Enlist the roles and responsibility of NDMA in managing disaster in Inida.
6. Write a short note on National Executive Committee in relation to disaster management.

■ **Long Question Answer :**

1. Elaborate the steps that are necessary to take while planning for disaster management ?
2. What is disaster management ? Explain what need to be done before, during and after any disaster occurs ?
3. How wind can be agent to disaster in aviation industry ? Explain with an example.
4. Explain the causes of chemical and electrical hazards at the airport.
5. What is the role of AAI in managing disaster at India airports ?
6. Critically discuss the Disaster Management Act, 2005.

❖ **Enrolment No. :** ☐

1. How many hours did you need for studying the units ?

Unit No.	1	2	3
No. of Hrs.			

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	☐	☐	☐	☐	_____
Language and Style	☐	☐	☐	☐	_____
Illustration used (Diagram, tables etc)	☐	☐	☐	☐	_____
Conceptual Clarity	☐	☐	☐	☐	_____
Check your progress Quest	☐	☐	☐	☐	_____
Feed back to CYP Question	☐	☐	☐	☐	_____

3. Any other Comments

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AIR TRANSPORTATION & DISASTER MANAGEMENT

DR. BABASAHEB AMBEDKAR OPEN UNIVERSITY
AHMEDABAD

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ROLE OF SELF INSTRUCTIONAL MATERIAL IN DISTANCE LEARNING

The need to plan effective instruction is imperative for a successful distance teaching repertoire. This is due to the fact that the instructional designer, the tutor, the author (s) and the student are often separated by distance and may never meet in person. This is an increasingly common scenario in distance education instruction. As much as possible, teaching by distance should stimulate the student's intellectual involvement and contain all the necessary learning instructional activities that are capable of guiding the student through the course objectives. Therefore, the course / self-instructional material are completely equipped with everything that the syllabus prescribes.

To ensure effective instruction, a number of instructional design ideas are used and these help students to acquire knowledge, intellectual skills, motor skills and necessary attitudinal changes. In this respect, students' assessment and course evaluation are incorporated in the text.

The nature of instructional activities used in distance education self- instructional materials depends on the domain of learning that they reinforce in the text, that is, the cognitive, psychomotor and affective. These are further interpreted in the acquisition of knowledge, intellectual skills and motor skills. Students may be encouraged to gain, apply and communicate (orally or in writing) the knowledge acquired. Intellectual- skills objectives may be met by designing instructions that make use of students' prior knowledge and experiences in the discourse as the foundation on which newly acquired knowledge is built.

The provision of exercises in the form of assignments, projects and tutorial feedback is necessary. Instructional activities that teach motor skills need to be graphically demonstrated and the correct practices provided during tutorials. Instructional activities for inculcating change in attitude and behavior should create interest and demonstrate need and benefits gained by adopting the required change. Information on the adoption and procedures for practice of new attitudes may then be introduced.

Teaching and learning at a distance eliminates interactive communication cues, such as pauses, intonation and gestures, associated with the face-to-face method of teaching. This is

particularly so with the exclusive use of print media. Instructional activities built into the instructional repertoire provide this missing interaction between the student and the teacher. Therefore, the use of instructional activities to affect better distance teaching is not optional, but mandatory.

Our team of successful writers and authors has tried to reduce this.

Divide and to bring this Self Instructional Material as the best teaching and communication tool. Instructional activities are varied in order to assess the different facets of the domains of learning.

Distance education teaching repertoire involves extensive use of self- instructional materials, be they print or otherwise. These materials are designed to achieve certain pre-determined learning outcomes, namely goals and objectives that are contained in an instructional plan. Since the teaching process is affected over a distance, there is need to ensure that students actively participate in their learning by performing specific tasks that help them to understand the relevant concepts. Therefore, a set of exercises is built into the teaching repertoire in order to link what students and tutors do in the framework of the course outline. These could be in the form of students' assignments, a research project or a science practical exercise. Examples of instructional activities in distance education are too numerous to list. Instructional activities, when used in this context, help to motivate students, guide and measure students' performance (continuous assessment)

PREFACE

We have put in lots of hard work to make this book as user-friendly as possible, but we have not sacrificed quality. Experts were involved in preparing the materials. However, concepts are explained in easy language for you. We have included many tables and examples for easy understanding.

We sincerely hope this book will help you in every way you expect. All the best for your studies from our team!

AIR TRANSPORTATION & DISASTER MANAGEMENT

Contents

Dr. Babasaheb Ambedkar Open University Ahmedabad

BBAATR-302

Air Transportation & Disaster Management

BLOCK 4 : DISASTER MANAGEMENT PLAN

DISASTER MANAGEMENT PLAN

Block Introduction :

As it tries to provide an efficient and well–coordinated response to disasters, disaster management is significant. Disaster management is essential to providing prompt and effective aid to those affected by disasters through efforts to save lives and lessen the effects of crises on affected communities.

Disaster management is crucial in the first place because it coordinates the response to a disaster. The goal of disaster management is to efficiently mobilise the necessary manpower, resources, equipment, and help to assist those affected by disasters. Disaster management organises all parts of disaster response. Disaster management is essential for many reasons, including control and supervision of a disaster response.

Disaster management's goal is to lessen the effects of disasters on the impacted communities and help people recover. The establishment of efficient tools, strategies, and procedures for how reactions should be focused makes disaster management crucial. Another reason disaster management is essential is that it attempts to reduce the risks and negative consequences of catastrophes over the long run.

Numerous methods and procedures that control how responses are coordinated are part of disaster management. The standard emergency response principles that are essential to providing populations affected by disaster with efficient aid will be covered in this block.

Block Objectives :

After understanding this block learns will have knowledge and its objectives is :

- To learn about different types of Aviation Disasters
- To comprehend Disaster Management Plan for local Standby & Full Emergency
- To make learner aware about the Emergency Response for Enemy Action or Sabotage
- To understand the concept of Risk Assessment & Process, Severity of Hazards, Probability of Occurrence and Risk Classification
- To learn about the Quantitative and Qualitative Methods for Risk Assessment
- To deeply learn the Risk Matrix and Risk Assessment in Aviation
- To learn the Emergency Response Plan & it various categorization To comprehend the operation and Management Control by airport Emergency Managing Committee & Training, Education and Mock Drills

Block Structure :

Unit 1 : Disaster Management Plan

Unit 2 : Disaster Risk Assessment & Mitigation

Unit 3 : Disaster Preparedness & Response

UNIT 01 *Disaster Management Plan*

UNIT STRUCTURE

1.0 LEARNING OBJECTIVES :

- To comprehend the different types of Aviation Disasters
- To understand the Disaster Management Plan for Local Standby & Full Emergency
- To learn about the Emergency Response for Enemy Action or Sabotage at airport

1.1 INTRODUCTION :

A disaster is a natural or man–made (or technological) hazard resulting in an event of substantial extent causing significant physical damage or destruction, loss of life, or drastic change to the environment. It is a phenomenon that can cause damage to life and property and destroy the economic, social and cultural life of people.

Natural disasters and manmade disasters like aircraft accidents, fires, terror attack & aircraft hijacking do occur at airports and therefore, it

is required to prepare Disaster Management Plan (DMP). Airport emergency planning is the process of preparing an airport to cope with an emergency occurring at the airport or in its vicinity. The object of airport emergency planning is to minimize the effects of an emergency, particularly in respect of saving lives and maintaining aircraft operations. The airport emergency plan sets forth the procedures for coordinating the response of different airport agencies (or services) and those agencies in the surrounding community that could be of assistance in responding to the emergency.

1.2 TYPES OF AVIATION DISASTERS :

Natural Disasters :

The natural disasters to which airport are likely to be subjected to are earthquake, flood, thunder and storms. Depending on the intensity, such acts of nature may cause severe destruction to the aircraft, airport buildings and installations, and even loss of life. While nothing can be done to avert them, there are actions that can be taken at design stage to minimize the impact and expedite restoration of airport operations during emergency using the emergency plan.

Natural Disasters are often sudden & intense and results in considerable destruction, injuries & death disrupting normal life as well as the process of development. Disasters due to natural calamity could be as follows

- Earthquake
- Flood
- Storm/ Cyclone
- Cloud burst/ lightning/ extreme weather conditions
- Fire

Man–Made Disaster :

Aircraft Accident Related Disasters :

Aircraft accident occurs near and within the airport during landing/ take off/taxing due to malfunctioning of some mechanism like undercarriage, failure of hydraulic power supply, non–functioning of one or more engines, malfunctioning of landing gear, sudden fire in aircraft while en–routing, unforeseen circumstances in which pilot loses control over aircraft and improper signaling by Air Traffic Control tower (ATC). Disasters due to emergencies could be as follows:

- Aircraft accident at airport
- Aircraft accident off airport
- Hazardous material emergency, hydrocarbon spills (Air Turbine Fule) followed by pool fire
- Fire

Terror Attack, Plane Hijack, Sabotage :

The threat of bombing vital installations by enemy action or sabotage cannot be ruled out near and within the airport. Since airports are vital facilities prone to terror attack/sabotage or plane hijacking, the threat to an airport could be from ground as well as from the air. Disasters due to external factors are on account of unlawful seizure, sabotage and bomb threat.

1.3 DISASTER MANAGEMENT PLAN :

1.3.1 Local Standby :

Local Standby is declared when an aircraft approaching the airbase is known or is suspected to have developed some defect but the trouble is not such as would normally involve any serious difficulty in effecting a safe landing.

The decision to declare Local Standby for an aircraft emergency rests with the Air Traffic

Control and the Air Traffic Control shall use the standard text and format for the declaration of Local Standby as follows :

Airport Local Standby :

- Aircraft Operator
- Aircraft Type & Flight Number
- Number of Persons on Board (POB) and Fuel on Board
- Planned Runway
- Estimated Time of Arrival (ETA)

1.3.2 Full Emergency :

Full Emergency is declared when an aircraft approaching the airbase is known or is suspected to be in such trouble that there is a possibility of an accident. The decision to declare Full Emergency rests with the Air Traffic Control.

1.3.3 Aircraft Crash within Airport Fire Service Turnout Area :

The Airport Fire Service turnout area shall include the entire airport area as well as the areas in the vicinity of the airport up to an arc of a circle centered at the runway threshold of 5 km radius, and 3 km from the perimeter of the airport. Crash action is declared for aircraft accidents on the airbase as well as off the airbase.

The Air Traffic Controller shall activate the crash alarm immediately if one of the following events occurs:

a. When the aircraft accident/ crash is sighted by the Air Traffic Controller or the sighting is reported to the Air Traffic Control by any of the reliable sources such as the "Follow–Me" vehicles plying in the aircraft movement area;

b. During poor visibility– when the Air Traffic Controller is unable to sight the runway, and the aircraft, which has been cleared for takeoff or land, fails to respond to the Air Traffic Control's repeated calls or the inputs from the Advanced Surface Movement Guidance and Control System (A–SMGCS) and other radar have indicated that the aircraft might have crashed; or

c. When the aircraft has been cleared to land and fails to land within 5 minutes of the estimated time of landing and the communication with the pilot is not able to be re–established. Or the inputs from A–SMGCS and other radar have indicated that the aircraft might have crashed.

If the crash is within the Airport Fire Service Turnout Area, the Air Traffic Control shall activate the crash alarm for at least one minute continuously, and the 'Crash' message shall be broadcast over the Crash alarm communication system. The 'Crash' message shall also be relayed to the Airport Fire Watch Tower.

The standard text and format used for the "Crash Action" message for aircraft crash within the airport Fire Service Turnout Area shall be as follows:

In case of Crash :

- Aircraft Type & Flight Number; Location of Accident
- Grid Map Location [*SQUARE (Alpha–Numeric)], Time of Accident
- Number of Persons on Board (POB)
- Fuel On Board
- Aircraft Operator

*The 'Square' is the alpha–numeric grid reference indicated on the Crash Map.

If the aircraft accident occurs on the runway, the Air Traffic Control shall give clearance for the responding airport fire vehicles to enter the runway as soon as possible.

1.3.4 Aircraft Crash outside Airport Fire Service Turnout Area :

If an aircraft accident occurs outside the Turnout Area, the procedures for Crash Action outside the Airport Fire Service Turnout Area shall be as followed.

The decision to declare the Crash Action rests with the Air Traffic Control. If it is clear to the Air Traffic Controller that the aircraft has crash and landed outside the Airport Fire Service Turnout Area, the standard text and format used for the 'Crash Action' message shall be as follows :

In Case of Aircraft Crash outside Turnout Area :

- Aircraft Type & Flight Number; Location of Accident (approximate),
- Time of Accident,

- Number of Persons On Board (PoB); Fuel On Board,
- Aircraft Operator,
- Any dangerous goods on board including quantity and location (if known)

State Authorities/District Administration will be overall in charge of all ground operations at the scene. All the other agencies and services involved will activate their respective emergency operations plans to support the State Authorities/District Administration in the mitigation of the aircraft accident. Local Fire Service will be fully in charge and resume command of the aircraft fire–fighting and rescue operations at the crash site.

1.3.5 Fires on the Ground (Aircraft Related Fires in Aircraft Movement Areas) :

An aircraft can catch fire while it is taxing in the movement area or parked at an aerobridge or remote bay. Such a scenario can arise from a defect or malicious act, and may develop into a major disaster. The resources required to mitigate are thus identical to that of an aircraft crash within the Airport Fire Service Turnout Area. When the aircraft on the ground catches fire and is sighted by the Air Traffic Controller or reported to the Air Traffic Control by any reliable sources, the Air Traffic Controller shall activate the Airport Fire Service through the crash alarm communication system and provide details of the aircraft fire, for example:

- Location of aircraft;
- Nature of fire (e.g. undercarriage fire, engine fire);
- Number of Passenger On Board (POB);

The Air Traffic Controller shall give clearance to the responding fire vehicles to enter the runway/taxiway as soon as possible. If the fire is large and has caused extensive damage to the aircraft and external resources are required to aid in the mitigation process, the Air

Traffic Controller shall declare "Aircraft on Fire". The standard text and format used for the "Aircraft on Fire" message shall be as follows:

Aircraft on Fire :

- Aircraft Operator;
- Aircraft Type & *Flight Number; Location of Aircraft;
- Nature of Fire (e.g. undercarriage fire, engine fire);
- Number of Persons on Board (POB);
- Any Dangerous Goods on Board.

(*The information shall be provided if it is available and applicable.)

The Sequence of Activation for 'Aircraft on Fire' shall be similar to that of "Aircraft Crash within the Airport Fire Service Turnout Area". The use of the phrase "Aircraft on Fire" is to give distinction and therefore avoid confusion between aircraft crash and aircraft on the ground on fire.

1.3.6 Fires on the Ground (Fires Involving Airport Building and Infrastructure) :

Fire may occur at any of the airport installations and buildings. If out of control, such a fire may cripple the key airport facilities and disrupt the normal airport operations. During a fire occurrence, however small it may appear to be, person who discovers it shall:

- Raise the fire alarm via the nearest manual call point. If no manual call point is readily available, raise the alarm by other available means;
- Inform the Airport Fire Service immediately of the exact location of the fire; and
- Operate a suitable fire extinguisher where readily available, or any water hose reel within range.

On receipt of a structural fire call, the Fire Watch Tower operator shall request the caller to provide the following details :

- Location of fire;
- Type of fire;
- Name of caller; and
- Telephone number of caller.

1.3.7 Dangerous Goods Accidents/Incidents :

Dangerous goods accidents/incidents may occur :

- During an "Aircraft Crash" in which the aircraft concerned is carrying dangerous goods;
- During a "Full Emergency" in which the aircraft concerned is carrying dangerous goods;
- During a "Local Standby" in which the aircraft concerned is carrying dangerous goods;
- During "Fires on the Ground" in which the aircraft is carrying or in the process of loading/unloading dangerous goods; or
- When consignments of dangerous goods are damaged during loading or unloading from the aircraft or during delivery or collection from cargo terminals/warehouses within the airport.

1.4 EMERGENCY RESPONSE FOR ENEMY ACTION OR SABOTAGE :

Bomb alert on aircraft :

a. Any aircraft that is suspected of carrying a bomb should be parked in Isolated Bay Area.

b. All passengers should be evacuated immediately by the fastest means while the local or airport police arrange for bomb disposal experts to attend and search the aircraft. All baggage should be left on board until it has been searched and cleared. Airport rescue and

fire services should be standby at point no less than 300m from air craft and predetermined procedure for bomb alerts should take into account the calling of local authority services of fire, police, ambulance and hospitals.

c. These types of incidents may occur on the ground or in the air including the seizure of an aircraft unlawfully, the placement of bomb on board or suspected bomb on board or armed attack on the aircraft which may include taking of hostage in such cases airport normally have contingency plan which firstly demand positioning the aircraft away from the main runway and terminal building and secondly police and law enforcement agencies are contact as necessary.

The Air traffic control must :

- Maintain continuous communication with the rescue and fire fighting services to ensure that they are kept updated in relation to any change in distressed aircraft condition.
- Attend to bomb threat calls received to aircraft, terminal building, vital installations and arising from unclaimed observed insides/ outside the airport and safe neutralization of explosives devices found.
- Conduct regular training of airport security police and staff, airline agencies working at the airport. This training is based for identification of explosives.

❑ **Check Your Progress :**

1. ATC acronym stands for _____

   a. Automatic Traffic Control b. Air Traffic Control

   c. All Traffic Control d. None of the above options

2. Local Standby is the condition in which _____

   a. Possibility of accident is not there but some defect is detected by ATC

   b. Possibility of accident is high when aircraft is approaching the airbase

   c. Possibility of trouble to the passenger is high

   d. All of the above options

3. Full emergency is the condition in which _____

   a. Possibility of accident is not there but some defect is detected by ATC

   b. Possibility of accident is high when aircraft is approaching the airbase

   c. Possibility of trouble to the passenger is high

   d. All of the above options

4. Aircraft Crash within airport fire service turnout area is _____
   a. 3 km radius
   b. 5 km radius
   c. Both a and b options
   d. None of the above options
5. In case Aircraft Crash outside Airport Fire Service Turnout Area in that situation 'Crash Action' message shall contain information.
   a. Aircraft Type & Flight Number; Location of Accident (approximate), Time of Accident,
   b. Number of Persons On Board (PoB); Fuel On Board,
   c. Aircraft Operator,
   d. All of the above options
6. In case of airport building or infrastructure related fire Watch Tower operator will request information regarding.
   a. Location of fire
   b. Type of fire
   c. Name and telephone number of caller
   d. All of the above options
7. Dangerous goods accident may happen in case of _____
   a. Aircraft Crash
   b. Local Standby and Full Emergency
   c. Both a and b options
   d. None of the above options
8. In case of enemy action or sabotage airport resuce should be standby at point no less than _____
   a. 300 m
   b. 500 m
   c. 700 m
   d. None of the above options

1.5 LET US SUM UP :

The process of developing plans to help communities lessen their vulnerability to risks and deal with disasters is known as disaster management. A Disaster Management Plan is created using instructions from the Disaster Management Cell, with the goal of helping passengers in the event of emergencies. In order to avert or at least lessen bad effects in the event of a disaster, it will provide role players with leadership guidance. This advice will be updated depending on real–world experience and/or site requirements. We will discuss the main areas of the disaster management plan in detail in this unit.

1.6 ANSWERS FOR CHECK YOUR PROGRESS :

1. b **2.** a **3.** b **4.** a
5. d **6.** d **7.** c **8.** a

1.7 GLOSSARY :

Disaster Management Plan : Disaster Management is the creation of the plans or through which communities reduce vulnerability to hazards & cope with disaster.

Dangerous Goods : A dangerous good (also known as hazardous material or hazmat) is any substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

Full Emergency : It is defined when an aircraft is approaching an aerodrome in such a manner that there is a danger of an accident occurring.

Local Standby : It is defined when an aircraft is approaching an aerodrome in such a manner that there would not normally prevent it from making a safe landing, but has a defect of some kind.

Radar : It is an electromagnetic sensor used for detecting, locating, tracking, and recognizing objects of various kinds at considerable distances.

1.8 ASSIGNMENT :

1. What actions need to be taken when aircraft crashes within fire service turnout area and outside fire service turnout area ?
2. How air traffic respond to the bomb alert on aircraft ?

1.9 ACTIVITIES :

1. Prepare a list of responsible authorities at Airport who will response in case of emergency.
2. After reading this unit make a list of work undertaken by Air Traffic Control unit in case of Local Standby, Full Emergency, Fire at airport, aircraft or nearby area.

1.10 CASE STUDY :

Case Study: Business Aviation's Niches

Business aviation, widely recognised as an effective business tool for companies requiring fast and secure flight services, plays a less publicised but vital role in emergencies, humanitarian support and relief efforts around the world. Its flexibility allows it to mobilise on short notice, provide aircraft types suited for specific missions and operate into airports that are inaccessible to others. Other missions are uniquely tailored to business aviation's capabilities, such as the transport of persons with highly contagious diseases.

Phoenix Air Group, a US company, is the only business operator worldwide with the capability to transport patients with a highly infectious disease in an intensive care unit.

A cooperative effort between the US Centers for Disease Control, Department of Defense and Phoenix Air in 2007 led to the development of the Airborne Biological Containment System, a customised, negative–pressure isolation unit designed and certified to be used in the company's modified Gulfstream G–III aircraft. The unit isolates the contagious patient from the flight crew and medical professionals on board while allowing for the provision of intensive care.

In August 2014, at the height of the Ebola epidemic in western Africa, the US Department of State turned to Phoenix Air for assistance, as two American aid workers had contracted Ebola in Liberia and were near death. Phoenix Air deployed one of its specially equipped aircraft and flew them to a hospital in Atlanta, where both ultimately recovered. During the outbreak, Phoenix Air used its containment unit to transport 41 patients to hospitals in the US and Europe.

The success led to the development of a multi–patient transport unit, the Biological Containment System, which has the capacity to transport four highly contagious patients and six medical attendants inside a B747–400 cargo aircraft or military transport.

Questions :

1. Discuss the role of aviation sector in planning any disaster and resilience.

1.11 FURTHER READING :

1. Disaster Management (2021), A.K. Srivastava, Scientific Publishers (India)
2. Disaster Management: Enabling Resilience (2014), Anthony Masys, Springer Nature
3. Disaster Management, R. Subramanian, Vikas Publishing House

UNIT 02

Disaster Risk Assessment & Mitigation

UNIT STRUCTURE

2.0 LEARNING OBJECTIVE :

- To learn about the risk, it's assessment and classification
- To comprehend about the severity of hazards
- To understand about the operational risk and risk matrix in aviation safety management system

2.1 INTRODUCTION :

Risk assessment is the process of determining the location, nature, and severity of risk sustained by the public and private sectors after a disaster. The typical risk assessment estimates the losses and the impacts of those losses on the affected individuals and communities. Federal, state, and local governments share the responsibility of conducting risk assessments. Each level of government must be prepared to carry out its role to complement and support the others.

Risk Assessment is a preliminary onsite evaluation of risk or loss caused by an accident or natural event. Risk assessments record the extent

of risk, what can be replaced, restored or salvaged. It may also estimate the time required for repair, replacement and recovery.

Disaster Risk assessment is a process to determine the nature and extent of such risk, by analyzing hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

This unit focuses on the role of the governmental bodies in the risk assessment process.

A strong risk assessment supported by accurate information will :

- Identify the needs of individuals and communities affected by the disaster.
- Determine if there exist sufficient county and local resources address recovery needs or if state and federal government resources are required for successful recovery
- Identify, allocate and prioritize the state and federal resources that are needed for the response and recovery efforts.

Document and substantiate requests for federal assistance.

2.2 RISK ASSESSMENT :

Definition :

Risk Assessment is an evaluation based on engineering and operational judgement and/or analysis methods in order to establish whether the achieved or perceived risk is acceptable or tolerable.

Risk is the assessed potential for adverse consequences resulting from a hazard. It is the likelihood that the hazard's potential to causing harm will be realised. (ICAO Doc 9859)

Risk means the combination of the overall probability or frequency of occurrence of a harmful effect induced by a hazard and the severity of that effect.

Risk assessment is performed to determine the magnitude of risk and to establish whether measures are needed to contain it within defined limits. Risk assessment does not represent an end in itself, but should contribute to controlling risks to an acceptable or tolerable level.

2.3 RISK ASSESSMENT PROCESS :

Amendments to several Annexes to the Chicago Convention applicable since November 2009 introduced harmonised requirements for the implementation of Safety Management Systems (SMS) by aviation service providers. Aircraft operators and other aviation service provider organisations should establish and apply a formal risk management process within the framework of the organisational SMS. Risk management shall ensure that :

Step 1 : Risks are systematically analysed (in terms of probability of occurrence and severity of hazard effects)

Step 2 : Assessed (in terms of tolerability) and

Step 3 : Controlled to an acceptable level (by implementation of mitigation measures).

Aircraft operators and aviation service providers shall also define those levels of management with authority to make decisions regarding safety risks tolerability.

Since Risk Assessment is the second step in the risk management process. Once hazards and their effects have been determined during the first step by means of hazard identification, an analysis is required to assess the probability of the hazard effects occurring and the severity of these effects on aircraft operation. ICAO Doc 9859 – Safety Management Manual highlights the importance of distinguishing between hazards (the potential to cause harm) and risk (the likelihood of that harm being realised during a specified amount of risk exposure).

Risk assessment is based on the evaluation of the following criteria: the severity of a hazard, the probability (frequency) of its occurrence and tolerability of its effects.

2.4 SEVERITY OF HAZARDS :

The ultimate criterion used to assess the severity of hazards is the impact on the safety of an aircraft and its occupants and other persons who may be directly affected. Elements to be considered in the severity assessment would include a number of indicators, such as crew workload, exposure time to the hazard, aggravating factors etc. Another group factors to be taken into account are the means of mitigation that are considered acceptable by the safety regulator, for example the effective use of Airborne Collision Avoidance System (ACAS) as mitigation means for mid–air collision hazard.

The severity of hazards will be determined by the credible effects on the safety of aircraft, when the outcome of all the weaknesses, potential failures and safeguards (barriers) which may exist in the relevant operational environment have been taken into consideration. For example, the most severe effect (consequence) will only be chosen in such cases when the total system has exhausted its possibilities to affect what continues to happen and only chance determines the outcome, for example the ingestion by aircraft engines of birds greater than they are designed and certificated to withstand and continue functioning where this occurs simultaneously to more than one engine.

A credible assessment of the severity of hazard effects requires detailed knowledge of the environment of operations and the services (functions) to be performed.

2.5 PROBABILITY OF OCCURRENCE :

The estimation of the probability of a hazard occurring (or in other words the interval of exposure in which a hazard effect may manifest itself) is usually achieved by means of structured review using a standard classification scheme.

In some cases, data may be available that will allow the making of direct numerical estimate of the probability of occurrence. This is usually the case when estimating the probability of failure of hardware components of a system. Extensive data are often available on historical component failure rates.

However, the estimation of the probability of occurrence of hazards (and their effects) which is associated with human error is not straightforward. Unless there is a very high capture rate of relevant occurrence data which has been appropriately stratified, it may be difficult to find meaningful empirical data and subjective assessment will then be all that is possible. As with the estimation of the severity of a hazard, the development of informed judgments from a structured review by people with extensive experience in their respective fields applied to a standard classification scheme will be the best substitute for absolute values.

The probability classification scheme shown below is extracted from ICAO Doc 9859 – Safety Management Manual. It specifies the probability as qualitative categories, but also includes numerical values for the probabilities associated with each category.

	Probability of Occurrence Definitions				
	Extremely Improbable	**Extremely Remote**	**Remote**	**Reasonably Probable**	**Frequent**
Qualitative definition	Should virtually never occur in the whole fleet life	Unlikely to occur when considering several systems of the same type, but nevertheless has to be considered as being possible	Unlikely to occur during the total operational life of each sytem but may occur several times when considering system of the same type	May occur once during the life of one system	May occur once or several times during the operational life
Quantitative definition	$< 10^{-9}$ per flight hour	$< 10^{-7}$ to 10^{-9} per flight hour	$< 10^{-5}$ to 10^{-7} per flight hour	$< 10^{-3}$ to 10^{-5} per flight hour	< 1 to 10^{-3} per flight hour

2.5.1 Risk Classification :

Both probability of occurrence of a hazard effect and the severity potential of that effect, need to be taken into account when deciding on the tolerability (acceptability) of a risk. It is a common practice to use a risk classification matrix in support of this two–dimensional judgement.

An example of a risk classification matrix used in ATS is provided below. It has been extracted from ICAO Doc 9859 – Safety Management Manual. Severity is ranked as Catastrophic, Hazardous, Major or Minor, with a descriptor for each indicating the potential severity of consequences. Probability of occurrence is ranked through five different levels of qualitative definitions, and descriptors are provided for each probability of occurrence.

		Probability of Occurrence Definitions				
		Extremely Improbable	**Extremely Remote**	**Remote**	**Reasonably Probable**	**Frequent**
Severity	**Catastrophic**	Review	Unacceptable	Unacceptable	Unacceptable	Unacceptable
	Hazardous	Review	Unacceptable	Unacceptable	Unacceptable	Unacceptable
	Major	Acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable
	Minor	Acceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable

Numerical values may be assigned in order to weigh the relative importance of each level of severity and probability. A composite assessment of risk, to assist in comparing risks, may then be derived by multiplying the severity and probability values.

Depending on the approaches and methodologies used, risk can be expressed in various ways, for example:

- Number of fatalities for a period of time;
- Loss rates (e.g. number of fatal accidents per kilometres or miles flown/flight hours flown etc.);
- Probability of serious accidents in certain time span or per flight hours flown;
- Expected value of losses versus annual operating revenue; Etc.

Throughout the aviation industry, many different versions of risk assessment matrices are available. Some definitions and categorisations vary, but the general concept remains the same.

2.5.2 Tolerability Assessment :

The output from risk classification is used to determine the risks the organisation should act upon. Decision making will require clearly defined criteria about acceptable or tolerable risk and unacceptable risk. The assessment of tolerability (acceptability) is critical in making rational decisions to allocate the limited organisational resources against those risks posing greatest threats and this process often may require a cost–benefit analysis. ICAO explains the process of defining risk tolerability by the following:

"Having used a risk matrix to assign values to risks, a range of values may be assigned in order to categorise risks as acceptable, undesirable or unacceptable. These terms are explained below:

- Acceptable means that no further action needs to be taken (unless the risk can be reduced further at little cost or effort);
- Undesirable (or tolerable) means that the affected persons are prepared to live with the risk in order to have certain benefits, in the understanding that the risk is being mitigated as best as possible;
- Unacceptable means that operations under the current conditions must cease until the risk is reduced to at least the tolerable level.
- Various strategies and approaches can be used by aircraft operators and aviation service providers in order to reduce the unacceptable risks to tolerable levels. This third and very important step of risk management is discussed further in the Risk Mitigation article.

2.6 QUANTITATIVE AND QUALITATIVE METHODS FOR RISK ASSESSMENT :

According ICAO Doc 9859 – Safety Management Manual, there are many options – formal and less formal – to approach the analytical aspects of risk assessment. For some risks, the number of variables and the availability of both suitable data and mathematical models may lead to credible results with quantitative methods (requiring mathematical analysis of specific data). However, ICAO states that few hazards in aviation lend themselves to credible analysis solely through quantitative methods. Typically, these analyses are supplemented qualitatively through critical and logical analysis of the known facts and their relationships.

Federal Aviation Administration in Advisory Circular (Introduction to SMS for Airport Operators), suggests that determination of severity should be independent of the probability of occurrence, and vice versa, the probability of occurrence should not be considered when determining severity. Over time, quantitative data may support or alter the determinations of severity and probability, but the initial risk determinations will most likely be qualitative in nature, based on experience and judgment more than factual data.

2.7 OPERATIONAL RISK FOR AIRLINE SMS :

Operation risk is a primary concern of airline Safety Management Systems (SMS). Just as in traditional safety programs, modern SMS implementations will revolve around identifying hazards and controlling these safety events.

In a formal aviation SMS implementation, there are two inter–connected components:

1. Safety Risk Management (SRM); and
2. Safety Assurance (SA).

These two risk management components remain critical for airlines to identify hazards and mitigate credible risk scenarios to prevent unwanted hazard related consequences. Operational risk in aviation SMS is primarily analyzed in:

1. Reactive Risk Management activities; and
2. Proactive Risk Management activities.

Four Identified Categories for Operational Risk at Airlines :

We can break down operational risk for airlines and similar service providers to the following categories:

1. Loss of Control in Flight (LOC–I),
2. Runway Safety,
3. Fatigue Risk Management and
4. Controlled Flight Into Terrain (CFIT)

Loss of Control in Flight (LOC–I) :

Fortunately, loss of control in flight is relatively rare occurrence in aviation SMS. Out of all documented accidents from 2012–2016, this type of risk accounted for only 8% of all accidents.

Unfortunately, loss of control is generally a severe type of risk as it usually results in egregious risks. Accordingly, 90% of LOC–I accidents resulted in fatalities. Some ways to help reduce the likelihood of these risks happening are:

- Understanding how environmental factors affect flight control;
- Reviewing historical occurrences in the airline service provider industry of flights that features loss of control;
- Flight recovery training;
- Understanding most common hazards (dangerous conditions) that lead to loss of control; and
- Understanding the threats and root causes that eventually result in loss of control.

Mitigating LOC–I occurrences will only marginally reduce the total number of aircraft accidents, but it can significantly reduce the overall number of flight–accident fatalities. The best types of risk controls should focus slightly more on mitigating risks, as likelihood for LOC–I incidents are already fairly low.

Runway Safety :

Runway safety incidents are the "annoying rock in the shoe" of aviation SMS. The following kinds of occurrences have historically (and currently) plagues airlines and airports :

- Runway incursions and excursions;
- Runway overshoot/undershoots;

- Hard landings; and
- Tail strikes.

Runway safety incidents are the exact opposite of LOC–I. For example, in 2016, runway excursions accounted for a whopping 19% of accidents – the most common type of accident by far. However, only 6% of these types of accidents resulted in fatalities in the 2012–2016 period.

Situational awareness will play the biggest role in preventing runway safety incidents. The best mitigation efforts will focus slightly more on reducing the likelihood of runway safety incidents, as the relative severity of runway incidents is fairly low.

Fatigue Risk Management :

Fatigue Crew : Flight crew and cabin crew fatigue is ubiquitously considered as a hazard that will impact general safety function. By "general safety function," we are talking about wide–ranging degradation of human ability to:

- Practice safety behaviour; and
- To respond to safety incidents.

This is especially true in terms of how fatigue effects :

- Situational awareness;
- Ability to communicate;
- Mission focus; and
- Energy to follow procedures (i.e. fatigue leads to complacency).

Obviously, humans cannot go without sleep, and therefore fatigue will never go away. There are two approaches to managing fatigue–risks as recommended by ICAO Standards and Recommended Practices (SARPs):

- Prescriptive fatigue management: operations remain within prescribed limits (by regulator) for flight time, duty periods, and rest periods; and
- Fatigue Risk Management System: operators use an FRMS system specifically designed to identify and manage fatigue as it arises during operations.

FRMS allows for more flexibility than prescriptive operations, but do require more resources, work, and responsibility on the part of operators.

Controlled Flight into Terrain (CFIT) :

Controlled flight into terrain (CFIT) probably represents the most severe type of operational risk for airline service providers. This is due to the extremely high fatality rate and hull loss rates when these safety incidents occur.

For example, there were 67 CFIT accidents between 2005 and 2014, which causes 1346 fatalities. This is an average fatality rate of 20 persons

every time this incident occurs. Moreover, in this same period of time, those accidents featured a 99% hull loss rate (i.e., 66/67 aircraft featured hull loss).

The number one contributor to CFIT is human performance deficiencies. IATA found that in all CFIT incidents (100%) in the 2005–2014 time period, undesirable behaviors contributed to the accident – specifically, situational awareness.

Final Thought: Future and Emerging Operational Risks :

Emerging risks that will increasingly need to be considered in the conversation of operational risk for aviation service providers are:

- Unmanned Aircraft Systems (i.e., drones),
- Cyber Security and
- Concerns over conflict zones as tensions rise in many places worldwide.

Breaking down your system's operational risk profile into these four categories will help categorize risk and focus resources on mitigating the likelihood and/or severity of occurrences in that category. In general, the four types of control measures used for these related mitigation efforts are:

- Technology;
- Aviation safety training;
- Awareness (i.e., hazard identification); and
- Compliance.

2.8 RISK MATRIX AND RISK ASSESSMENT IN AVIATION SMS :

Risk matrices are probably the inter–industry safety standard as the primary tool used in risk evaluation. In aviation Safety Management Systems (SMS) they are ubiquitous.

Risk matrices are simplistic charts (though not necessarily "simple") that use "probability" and "severity" to quantify the risk priority of a real or hypothetical safety scenario. The quantification is generally broken into 3 categories:

- Acceptable risk (green);
- Unacceptable risk (red); and
- Acceptable with mitigation, meaning risk may not yet be as low as reasonably possible (ALARP) (yellow).

Some organizations use 1 or 2 additional colours, such as light green and/or orange, though these colours only provide further "aesthetic" and risk granularity rather than general quantification. Risk matrices are ultimately used as risk management tools to rank risks with the risk grid and the calculated risk indices.

The Risk Matrix Grid :

The risk matrix is broken into a grid. The grid is usually 5 x 5, though it can be larger or smaller depending on company needs – we will use a 5 x 5 grid in this article, which happens to be the ICAO default risk matrix. The grid is used to assign a calculated "number" to the risk, which is a combination of Probability x Severity and represents the risk priority.

The Risk Matrix Grid :

- Usually increases in severity from left (low) to right (high);
- Usually increases in probability from bottom (low) to top (high); but
- A risk matrix can move in any direction, so you may see risk matrices that move from right to left and top to bottom, right to left and bottom to top, or left to right and top to bottom.

We will consider the most common use of risk matrices, from left to right and bottom to top. As you can see, there is a lot of flexibility about how the risk matrix "appears" or is "laid out." What matters most is that it is:

- Consistent and comfortable in your organization
- Easy to use
- Not changed frequently to preserve historical significance and
- Used in training organizational safety professionals as well as department heads and process owners.

Despite the fact that a risk matrix only contains two variables, there is a surprising amount of confusion or misunderstanding about how to use it. I constantly see different opinions about how to use it – some of these opinions are better than others. We will look at the probability and severity below, and then consider the 2 "best use cases" of a risk matrix during risk assessment.

Probability in Risk Matrix :

Risk Matrix in aviation SMS risk management processes

Risk matrix probability can be used by companies in a few different ways, depending on how an organization defines "probability." Probability can also mean likelihood or frequency, and is commonly known as ranging from "extremely rare in the industry" to "reported often in the company." Probability can be used to quantify:

1. The likelihood of the risk event happening, such as a runway incursion;
2. The likelihood of negative consequences materializing, such as aircraft risk from bird strike; or
3. An overall probability of a risk scenario, including the likelihood of a risk event and negative consequences materializing.

Many companies use probability to assess the likelihood of consequences in their SMS' documented risk management processes, though I also highly advocate using it for point #1 because point #1 is "risk event–specific" and, in my experience, a risk event's probability is easier to assess than the likelihood of potential consequences.

Likelihood is assigned a letter value for each increment in likelihood. Low probability is assigned A, while high likelihood (in a 5x5 grid) is assigned an E. Low likelihood events mean that either the risk event/ consequences are uncommon OR that good risk controls are in place to effectively mitigate the probability.

Risk probability	Risk severity				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5				5D	5E
Occasional 4			4C	4D	4E
Remote 3		3B	3C	3D	
Improbable 2	2A	2B	2C		
Extremely improbable 1	1A				

Severity definitions this matrix rates the severity of the risk on a scale from negligible to catastrophic. Each severity rating has a clear definition :

Catastrophic (Level A) :

- If the risk occurred it would:
- Cause multiple deaths and/or
- Destruction of equipment and resources

Hazardous (Level B) :

- If the risk occurred it would cause:
- A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely
- Serious injury
- Major equipment risk

Major (Level C) :

- If the risk occurred it would cause:
- A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency

- Serious incident
- Injury to persons

Minor (Level D) :

- If the risk occurred it would cause a:
- Nuisance Operating limitations
- Use of emergency procedures
- Minor incident

Negligible (Level E) :

- Few of consequences is negligible

In the above Risk probability table the X axis categorises the probability of a risk occurring. Each rating is numbered, which combined with the risk severity gives the risk index. Risk Probabilities are as follow:

Frequent (Value 5) :

- Likely to occur many times (has occurred frequently)

Occasional (Value 4) :

- Likely to occur sometimes (has occurred infrequently)

Remote (Value 3) :

- Unlikely to occur, but possible (has occurred rarely)

Improbable (Value 2) :

- Very unlikely to occur (not known to have occurred)

Extremely improbable (Value 1) :

- Almost inconceivable that the event will occur

2.10 RISK MANAGEMENT :

The goal of risk management is to proactively identify safety–related hazards and mitigate the associated risks. Risk management is an important component of Aeronautical Decision Making (ADM). When a pilot follows good decision–making practices, the inherent risk in a flight is reduced or even eliminated. The ability to make good decisions is based upon direct or indirect experience and education. The formal risk management decision–making process involves six steps

As you work through the Disaster Management Cycle, it is important to remember the four fundamental principles of risk management.

Accept no unnecessary risk. Flying is not possible without risk, but unnecessary risk comes without a corresponding return. If you are flying a new airplane for the first time, you might determine that the risk of making that flight in low visibility conditions is unnecessary.

Make risk decisions at the appropriate level. Risk decisions should be made by the person who can develop and implement risk controls. Remember that you are pilot–in–command, so never let anyone else–not ATC and not your passengers–make risk decisions for you.

Accept risk when benefits outweigh dangers (costs). In any flying activity, it is necessary to accept some degree of risk. A day with good weather, for example, is a much better time to fly an unfamiliar airplane for the first time than a day with low IFR conditions.

Integrate risk management into planning at all levels. Because risk is an unavoidable part of every flight, safety requires the use of appropriate and effective risk management not just in the pre–flight planning stage, but in all stages of the flight.

❑ **Check Your Progress :**

1. Risk assessment is the evaluation based on _____
   a. Operational judgement b. Engineering judgement
   c. Both a and b options d. None of the above option
2. SMS acronym stands for _____
   a. System Maintenance Safety b. Safety Management System
   c. System Management Safety d. Safety Maintenance and System
3. Probability classification scheme is extracted from ICAO doc number _____
   a. 9853 b. 9855 c. 9857 d. 9859
4. What is the correct order of severity ?
   a. Catastrophic, Minor, Hazardous, Major
   b. Catastrophic, Major, Hazardous, Minor
   c. Catastrophic, Hazardous, Major, Minor
   d. Catastrophic, Hazardous, Minor, Major
5. Acceptable risk means _____
   a. The affected person are prepared to live with the risk
   b. No need of further action required
   c. The operation must not cease until risk is reduced
   d. All of the above options

6. Operational risk in aviation SMS is primarily analyzed in _____
   a. Reactive Risk Management activities
   b. Proactive Risk Management activities
   c. Both a and b options
   d. None of the above options
7. Loss of Control in Flight (LOC–I) accidents are rare and accounted only _____
   a. 6% b. 7% c. 8% d. 9%
8. In risk matrices the unacceptable risk is colour coded.
   a. Green b. Red
   c. Yellow d. None of the above options
9. The risk matrix grid is _____
   a. 3 x 3 b. 5 x 5 c. 7 x 7 d. 9 x 9
10. Level A severity rating is _____
    a. Catastrophic b. Hazardous c. Major d. Minor

2.10 LET US SUM UP :

Aviation emergency management's main goal is to safeguard people's lives and airport property. We can take into account both new and existing disaster risks when planning our emergency response actions with the use of a disaster risk assessment reduction method. This gives us the ability to plan or modify our operations to make people and communities safer and more disaster–resistant while also preserving efforts to generate and extend enabling conditions for sustained development.

Disaster mitigation strategies are those that, by preventative actions performed before an emergency or disaster happens, remove or lessen the effects and risks of hazards. Plans for disaster risk reduction include goals and precise targets, as well as the actions that must be taken to achieve these goals. Learners studied risk assessment and its mitigation in the aviation industry in this unit.

2.11 ANSWERS FOR CHECK YOUR PROGRESS :

1. c	**2.** b	**3.** d	**4.** d	**5.** b
6. c	**7.** c	**8.** b	**9.** b	**10.** a

2.12 GLOSSARY :

Drone : An aircraft that does not have a pilot but is controlled by someone on the ground, used especially for surveillance or for dropping bombs in military actions.

Fatigue Risk Management : A data–driven means of continuously monitoring and maintaining fatigue related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Risk Assessment Matrix : A risk assessment matrix (sometimes called a risk control matrix) is a tool used during the risk assessment stage of project planning.

Proactive Risk Management : It means that you identify risks before they happen and figure out ways to avoid or alleviate the risk. It seeks to reduce the hazard's risk potential or, even better, prevent the threat altogether.

Reactive Risk Management : It tries to reduce the damage of potential threats and speed an organization's recovery from them, but assumes that those threats will happen eventually.

Runway Safety Programme : It promotes the establishment of Runway Safety Teams (RSTs) at airports as an effective means to reduce runway related accidents and incidents.

2.13 ASSIGNMENT :

1. What is the risk matrix and risk assessment in aviation security management system ?
2. What is severity of hazard and probability of occurrence give example of each.

2.14 ACTIVITIES :

1. Evaluate the criterion for assessing the severity of hazards at the time of occurrence of disaster.
2. Explain the risk matrix grid with examples of any real time aviation disaster.

2.15 CASE STUDY :

Experts Explain the Key Ways to Avoid and Mitigate Emergency Situations

by Aaron Karp

In early September last year, Hurricane Ida hit New Orleans hard. Signature Flight Support, the largest operator of FBOs in the world with more than 200 locations, safely evacuated its employees from its facility at Louis Armstrong New Orleans International Airport. But the hurricane completely destroyed the FBO's terminal and offices.

Aside from a fatal aircraft accident, this was just about the worst case scenario for an emergency at an FBO. "It really wrecked the facility," Jennifer Bartenstein, vice president for health, safety and environment for Signature Flight Support (SFS) says.

Nevertheless, the FBO was up and running the next day. "We didn't have an office, we didn't have a printer, but we made it happen out of some rental cars. We eventually upgraded to temporary facilities that have become our FBO while our facility is getting rebuilt," Bartenstein says. "To my knowledge, we only had to turn away one aircraft."

The rapid response was made possible by extensive emergency planning. "It falls under business continuity," Bartenstein says. "So, it's not only just responding to the emergency, but making sure our business continuity is there. I just think that is so critical."

Manual Work :

Emergency preparedness at business airports and FBOs starts with emergency response manuals.

"Make sure policies and procedures specific to each person's role in that response is part of any manual outlining emergency response plans," says Kevin Honan, senior advisor of operations manuals and emergency response plans for business aviation operators at AviationManuals. The company assists business airports and FBOs with all types of manuals, including emergency response plans.

"Make sure each person's role is well outlined and very clear," Honan adds. "During an emergency, especially if there is an injury or fatality involved, it's going to be hectic in the first hour getting everything together. Make sure your plan is covering everything, so everyone is singing from the same sheet of music. "I recommend having some sort of manual system in place. That way, everyone is using a standard procedure."

Bartenstein agrees that everyone involved in a potential emergency response needs to be quickly connected, making planning in advance crucial. "A saying in the emergency response world is that during the response to an accident is not the time to be exchanging business cards," she says. FBOs generally have to be in contact with officials at the airport where they are located during the response to an aircraft accident or other incident, she notes.

Bartenstein adds, "You should already know who you are going to be working with in case something does happen and have established relationships well in advance. There is a huge difference when you already have each person's phone number and you already know who to call."

Regular Exercises :

The next step for business airports and FBOs is to conduct emergency preparedness exercises. This summer London Biggin Hill Airport will hold a full–scale drill responding to a runway incursion that leads to an aircraft fire, fatalities and injuries.

The airport's fire service will set fire to an older fuselage no longer in use. A second aircraft, which is also no longer in use will not be set ablaze but will have 25 passengers – local residents acting as injured victims – who need to be evacuated and medically evaluated.

The exercise will take place on a Saturday, a deliberate choice since most senior staff are not at the airport. Part of the drill will be air traffic controllers communicating with senior airport staff and measuring how fast they can get from their homes to the airport. "We are testing all of our business continuity plans and our airport order emergency response

plans to measure their effectiveness," says Ben Spiers, head of safety and compliance at Biggin Hill.

In addition to the airport's in–house fire and rescue service, the local police and fire department will be involved. If a significant aircraft crashed, it would be all hands on deck, including local first responders from outside of the airport.

The airport's in–house fire and rescue services "conduct regular drills to make sure they can respond to any incident at any place at the airport within two minutes," says Spiers.

A full scale exercise is required at UK airports at least once every two years, although this will be the first at Biggin Hill in three years because of Covid–19. Airports and FBOs conduct planning meetings and table–top exercises on a more frequent basis. A table–top exercise is conducted at each of Signature's FBOs annually.

"Emergency planning meetings enable consultation with third party local authorities and third party agencies," Spiers explains. "We hold quarterly emergency planning meetings where we sit down with the local police, fire and ambulance services, along with the local councils and the different airport heads of departments to review, first and foremost, our emergency orders to make sure we align with local authorities and UK regulations."

FBOs must coordinate closely with the airports at which they are located. "There may be some cases where airports have specific requirements," Bartenstein, who oversees a staff of 20 dedicated to safety at Signature FBOs says. "We make sure our emergency plans coordinate with their plans. We make sure the emergency response plans are updated and accurate annually.

"When we come to a table–top or active exercise, in some cases we participate in an airport–driven exercise or invite them to ours."

The director of security and the director of the airport recently participated in an Signature emergency exercise at the company's FBO at Van Nuys Airport in California. "They provided great input and it was helpful for them to hear what our team members would expect to do in an emergency," Bartenstein explains. "We try to stay very close to the airport."

She adds that emergency response planning needs to prepare for a wide range of potential emergencies and ensure plans for each scenario are detailed. For example, FBOs should keep a careful eye on their fuel farms, both to prevent fires and ensure enough fuel is on hand.

"We are continuously monitoring our fuel loads to ensure it will be ready for emergency responders," Bartenstein says. "When you have a bad storm, it's going to be hard for the tanker to drive in. So if a storm is bearing down on an FBO, we make sure we have a little more fuel than we would normally have on site, to be ready for not having fuel deliveries for a few days."

Honan says that FBOs and business airports must "consider a variety of emergency scenarios, not just the typical aircraft accident."

Additionally FBOs should tailor their emergency response plans to their location. For example, an FBO in Florida or the Caribbean should have extensive plans for tropical storms and hurricanes, while a Canadian FBO should have full plans for snow emergencies.

Signature deploys a plan that is orchestrated on the corporate level and then localizes it for each FBO in its system. The corporate plan details best practices, Bartenstein explains, while the localized plan is aimed at the specific circumstances of a given FBO and takes into account geographic location.

Another key element of emergency planning is to have a designated command center ready to activate to oversee the response. The hierarchy of who will be making decisions and giving orders should be well established in emergency response plans, say Spiers and Bartenstein. Signature has both an onsite emergency command center at each FBO and a virtual corporate emergency command center that is activated in an emergency.

In the case of a hurricane like Ida, Signature activates a well rehearsed emergency response plan. With numerous locations in the southeast of the US and in the Caribbean, "sadly we are very good at responding to hurricanes," Bartenstein says.

"There is a corporate hurricane plan and things that each base has to do before a named storm. We have plans starting at 96 hours out from expected landfall. And then there's more to do at 72 hours, 48 hours, etc.

"Part of that plan is to ensure our facilities are well prepared. We bring aircraft into hangars if they are not evacuated. We take the time to make sure our personnel are OK. We let individuals know if the airport is closing and don't ask anybody to stay or be a hero. We don't want anyone to get hurt. We plan for who will come back in the storm's aftermath and ensure the safety of the facility."

Questions :

1. How can we foresee the disaster and plan the recovery after occurring of disaster ?
2. What preparedness at airports need to kept in the light of any future disaster ?

2.16 FURTHER READING :

1. Disaster Management: Text and Case Studies (2007), D.B.N. Murthy, Deep & Deep Publications
2. Textbook of Disaster Management (2013), Dr Nitesh Kumar, Satish Serial Publishing House
3. Disaster Management (2021), A.K. Srivastava, Scientific

UNIT 03

Disaster Preparedness & Response

UNIT STRUCTURE

3.0 LEARNING OBJECTIVES :

- To learn about the emergency response planning in the event of disaster
- To understand about the role & responsibility in handling emergencies
- To comprehend the airport emergency operations & its management
- To train and educate for the disaster management response

3.1 INTRODUCTION :

Disaster preparedness consists of a set of measures undertaken in advance by governments, organisations, communities, or individuals to better respond and cope with the immediate aftermath of a disaster, whether it is human–induced or caused by natural hazards. The objective is to reduce the loss of life and livelihoods.

Simple initiatives can go a long way, for instance in training for search and rescue, establishing early warning systems, developing contingency plans, or stockpiling equipment and supplies.

Disaster preparedness plays an important role in building the resilience of communities. With increasing population growth, rapid and unplanned urbanisation, climate change, environmental degradation and widespread poverty, a growing number of people and assets are exposed to disasters.

Moreover, many of these events occur in fragile and conflict–affected states, thus increasing the complexity of crises and overburdening countries experiencing violent conflict or fragile governance.

However, improved practice and response mechanisms save lives and strengthen the countries and communities' ability to reduce the impact of disasters. Understanding the occurrence and frequency of natural hazards, as well as the risks, vulnerabilities and potential impact on people and assets, helps to improve preparedness.

Instead of providing emergency response only, international efforts should help governments and communities invest in understanding risks and building preparedness capacities for pre–emptive and early action. Disaster preparedness is cost–effective and saves aid money.

3.2 EMERGENCY RESPONSE PLAN :

The actions taken in the initial minutes of an emergency are critical. A prompt warning to employees to evacuate, shelter or lockdown can save lives. A call for help to public emergency services that provides full and accurate information will help the dispatcher send the right responders and equipment. An employee trained to administer first aid or perform CPR can be lifesaving. Action by employees with knowledge of building and process systems can help control a leak and minimize damage to the facility and the environment.

The first step when developing an emergency response plan is to conduct a risk assessment to identify potential emergency scenarios. An understanding of what can happen will enable you to determine resource requirements and to develop plans and procedures to prepare your business. The emergency plan should be consistent with your performance objectives.

At the very least, every facility should develop and implement an emergency plan for protecting employees, visitors, contractors and anyone else in the facility. This part of the emergency plan is called "protective actions for life safety" and includes building evacuation ("fire drills"), sheltering from severe weather such as tornadoes, "shelter–in–place" from an exterior airborne hazard such as a chemical release and lockdown. Lockdown is protective action when faced with an act of violence.

When an emergency occurs, the first priority is always life safety. The second priority is the stabilization of the incident. There are many actions that can be taken to stabilize an incident and minimize potential damage. First aid and CPR by trained employees can save lives. Use of fire extinguishers by trained employees can extinguish a small fire. Containment of a small chemical spill and supervision of building utilities and systems can minimize damage to a building and help prevent environmental damage.

3.3 CATEGORIZATION OF EMERGENCIES :

Emergencies at airports can be classified under several broad headings. These headings are listed below together with a description of the type of emergency.

Local Standby :

Local standby will be declared when an aircraft approaching the airbase is known or is suspected to have developed some defect but the trouble does not normally involve any serious difficulty in effecting a safe landing.

Aircraft Disabled/Immobilized on Runway/Taxiway :

An incident such as bursting of tyres, hydraulic leakage/failure, undercarriage failure or any other technical problems, the aircraft can be disabled or immobilized on the runway or taxiway. Situation like this may require the pilot to disembark the passengers onboard in situ before the aircraft is removed or towed to its parking bay. To specifically deal with such a situation, a plan should be developed.

Full Emergency :

Full Emergency will be declared when an aircraft approaching the airbase is known or is suspected to be in such trouble that there is a possibility of an accident.

Crash Action :

Crash Action will be declared for aircraft accidents on the airbase as well as off the airbase. There are two types of Crash Action – for aircraft accidents that occur within the Airport Fire Service Turnout Area and for that which occur outside the Airport Fire Service Turnout Area.

In–Flight Mass Casualties :

Part 1 of ICAO Annexure 6 stipulates that the pilot–in–command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving his aircraft, which results in serious injury or death to any person or substantial damage to the aircraft or property. Mass casualties onboard will usually result from incidents such as an encounter with air turbulence during flight and mass food poisoning.

Fires on the Ground :

Fires on the ground can be aircraft related and non–aircraft related. Fires involving aircraft can be at any location on the runway, taxiway or apron area where the aircraft is parked. Non–aircraft related fires involve mainly the airport buildings and installations.

3.4 ROLE AND RESPONSIBILITY IN HANDLING EMERGENCIES :

The following table summarizes the key functions for the Rajkot Airport and other supporting organizations/ agencies/ services during a crisis

Sr. No.	Organization/ Agencies/ Services	Organization/Agencies/ Services
1	Airport Fire Service	Aircraft rescue and fire fighting operation
		Post-accident fire protection Support for triage activities
		Evacuate injured passengers to hospitals
		Support for structural fire-fighting and evacuation
		Support for mitigation and dangerous floods, accidents/Incidents
		Activate key officials and ground handling agent concerned
2	Airside Management/ Operation	Muster airline's and ground handling agent's resources
		Provide and direct ground service supports
		Provide inputs to air traffic control in regard to runway and taxiway closure
		Coordinate aircraft recovery and salvage operation.
3	Air Terminal Management	Activate key officials and other external agency/ services such as hospitals, panel doctors, ambulance services, bureau of civil aviation security, immigration and customs
		Setup the Emergency Co-ordination Centre (ECC), Survivors Reception Centre (SRC), Friends and Relative Reception Centre (FRRC) and Re-union Area (RA)
		Passengers facilitation and business recovery at terminal Buildings
		Support terminal building evacuation.
4	Engineering	Provide technical support and assistance
		Support recovery efforts
5	Corporate Communication	Media management
		Facilitate press releases and
		Organization of press conferences
6	Air Traffic Service	Activation and Termination of Crash Action, Full Emergency, Local standby, etc.
		Air traffic management including issuing NOTAM (notices to airman)

7	**Police**	Guarding of aircraft wreckage and preservation of evidence at the accident site including eye-witness accounts and photography
		Custody of flight data and cockpit voice recorders, cargoes onboard including dangerous goods, and baggage/passenger belongings
		Investigation and management of dead bodies including their identity establishment, mortuary arrangements, and release of the bodies.
		Arrange medical examinations of the crew members alive and passengers as well as post-mortem examinations of the deceased crew members and passengers mob control.

3.5 OPERATION AND MANAGEMENT CONTROL :

3.5.1 Airport Emergency Managing Committee :

To ensure coordinated action, an Airport Emergency Managing Committee will be constituted. The airport director will be the chairman of this committee. The committee will comprise of members from various airport departments including the following

- Airport Administration
- Air Traffic Control
- Airport Rescue and Fire Fighting
- Airport Security Services
- Safety Department
- Airport Medical Services
- Maintenance Department
- Environment Management Cell
- Representative from Airlines
- Transportation Department
- Cargo Facility
- Department of Information and Publicity
- Representative from local NGO's and Social Group

Also member from Airport Authority of India and district administration will be part of the committee.

Airport emergency managing committee will design the procedure, the emergency action plan, evacuation plan and procedures for implementation based on local needs and facilities available. For effective implementation of emergency action, coordination among the various agencies involved in Emergency Control Centre will be expected. Emergency control centre will be established as the supreme command

post for emergency action. For direct action and coordination at ground level mobile command post will be established. Emergency action committee will select officers in charge for emergency control centre.

3.5.2 Airport Emergency Operation/ Coordination Centre :

During a major airport disaster such as an aircraft crash or a severe fire outbreak at terminal building, the various emergency operations and coordination centers will be established immediately to mitigate the disaster. The Emergency Control Centre will be the top command for coordination and communication centre for all kinds of emergencies. The Chairman of Emergency Managing Committee will be the head of emergency control centre. Under his direction, chief officer will operate and regulate all emergency operation. The centre will operate under the directions of Airport Emergency Managing Committee. Its location will be fixed, as per the requirement emergency situations. The main features of this unit will be:

- Its fixed location
- It acts to guide and support to the on scene commander in the mobile command post for aircraft accidents/ incidents
- It will be operated by a specialized trained staff from Fire, Safety, Health and Environment department personnel of airport
- It will be the command, co–ordination and communication centre for unlawful seizure of aircraft and bomb threats
- It is operationally available 24 hours a day
- The location of the emergency operations centre should provide a clear view of the movement area and isolated aircraft parking position, wherever possible.

The Airport emergency operation centre should contain:

- Emergency alert and communication system.
- Adequate number of external telephones. The latest telephone directories with a list of important numbers.
- Adequate number of internal telephones and a P.A. system.
- Radio equipment, hot–lines and walkie–talkie.
- Plans of the airport to show various areas of airport
- Sources of sirens and safety equipments including fire, explosion, spill and gas controls.
- Stock of other fire extinguishing materials.

The airport emergency operations and coordination centers at the airport comprise Crisis Management Centre (CMC), Airport Emergency Response and Interaction Centre (AERIC), Emergency Coordination Centre (ECC), Mobile Command Post (MCP), Triage Area (TA), Survivors Reception Centre (SRC), Friends and Relatives Reception Centre (FRRC) and Reunion Area (RA). Each of them has its own functions and roles to perform during the crisis are as described below:

a. Crisis Management Center (CMC)

Established by the airport operator, the CMC is to function as an overall overseeing and controlling authority of the crisis mitigation process during an emergency. The committee of the CMC comprises the following permanent and supporting members:

Permanent members of CMC are :

- Chief Operating Officer
- Head, Engineering/Maintenance
- Head, Utility
- Head, Security
- Head, Airside Management
- Terminal Manager

Supporting members of CMC are :

- Ministry of Civil Aviation representative
- DGCA representative
- Airline concerned representative
- CISF representative
- Police representative
- Any other agencies required for proper handling of the crisis.

Functions of the CMC include :

Formulate strategic plans and policies, as well as engage in high level decision making for the mitigation of crisis;

- Control, coordinate and support operations during an aircraft accident;
- Oversee the work and progress of protracted fire–fighting & rescue, and salvage operations;
- Liaise with the airline concerned, local authorities, ministries, and governmental departments for support;
- Arrange and provide welfare to the staff involved in the mitigation of crisis;
- Regulate the release of information to the public on the facts of the disaster;
- Authorize the release of official passenger manifest and information pertaining to the aircraft accident;
- Issue press releases and organize press conferences; and
- Ensure that the post–accident operations are completed expeditiously so that the airport can resume normal operations in the shortest possible time.

b. Emergency Response and Interaction Centre (ERIC) :

When an accident occurs beyond the normal office hours, the CMC Committee may take longer–than–usual time to convene. As an interim arrangement, ERIC will be activated and its members will be notified as per the roster and convene within one hour of activation.

The ERIC group will carry out the general functions of the CMC until the latter comes into operation. When the CMC is operational, the ERIC will cease functioning and play the supporting roles as directed by the CMC. Before standing down the ERIC operations, the head of the ERIC group shall brief the CMC on the progress.

The ERIC Group comprises Officials on duty. The members are on a weekly rotation basis. All officials on the duty are required to have their mobile phones switched on at all times and be in a position to reach the airport within one hour of activation.

c. Emergency Coordination Centre (ECC) :

Located near to airport gate, the ECC will be established by the airport operator, in the event of a major disaster to coordinate the response and functions of the external supporting organizations, agencies, and services involved in the mitigation of the emergency. Functions of the ECC include :

i. Support crash site fire–fighting and rescue operations through liaison and coordination with the external organizations/agencies/ services;

ii. Facilitate mobilization of external resources to the crash site, such as issuing emergency passes and arranging with Apron Control for "Follow–me" vehicles;

iii. Friends and relatives facilitation at the airport; and

iv. Arrange and facilitate visits by the VVIPs to the crash site.

d. Mobile Command Post (MCP) :

The MCP will be established at the accident site to serve as an on scene command, coordination and communication centre for the accident. It is a point where the co–operating agencies heads/ representatives assemble to receive and disseminate information and make decisions pertinent to the rescue operations.

The MCP will be deployed to the accident site by the Airport Fire Service and be positioned at a distance of not less than 90 m upwind from the aircraft. The MCP will be headed by Head (Airside Operations), and Chief Airport Fire Service will be the alternate Head. When it is beyond the office hours, Duty Airport Manager (Shift–In–Charge) shall proceed to manage the MCP for the first hours until Head (Airside operations) or Chief Airport Fire Service arrives. Functions of the Mobile Command Post include :

- Establish communication with CMC and ECC.

- Establish contact with other agencies reporting at the crash site. Establish a staging area for all ground services equipment such as tow tractors, passenger steps, and coaches reporting to the crash site;
- Establish an Assembly Area for the uninjured survivors;
- Secure and provide any assistance required by the doctors at the Triage Area;
- Arrange speedy evacuation of injured casualties to the hospitals;
- Liaise with the airline concerned to transport the uninjured and casualties; and
- Maintain and update a record of casualty evacuation status including:
- Number of casualties evacuated from the aircraft; and
- Number of casualties evacuated to the Emergency Medical Centre, hospitals, and Survivors Reception Centre.

e. Triage Area (TA) :

Triage area is a location established usually near to the accident site, where triage operations (i.e. sorting and classification of casualties to determine the order of priority for treatment and transportation) are performed. In an aircraft crash accident, the triage area is normally established at a distance of not less than 100 m upwind from the aircraft. In triaging, casualties are classified into four categories given below and explain in the Table below:

1. Priority I Immediate care
2. Priority II Delayed care
3. Priority III Minor care
4. Priority IV Deceased

Medical Priorities in Triage Area			
Category (priority)	**Status**	**Arm band or Identification**	**Description**
P-I	Immediate Case	Red	Serious injuries, haemorrhage, asphyxia, facial injuries open and compound fracture, extensive burns, crash injuries and sever shock symptoms
P-II	Delayed Care	Yellow	Simple fracture, limited burns, cranial trauma, rapidly progressive shock. Injuries to sort parts burns less than 30%
P-III	Minor Care	Green	Minor injuries-need only first aid on the spot
P-IV	Dead	Black	Declared dead by the doctor

f. Assembly Area (AA) :

The Assembly area is an area set up near the accident site to temporarily receive the survivors until the arrangements to transport them to the Survivors Reception Centre are made. Depending on the doctors' assessments of their medical condition, most priority III casualties will also join them and bring to the Survivors Reception Centre.

g. Survivors Reception Centre (SRC) :

The Survivors Reception Centre (SRC) is a designated area set up for receiving the survivors (except for the flight crew and flight attendants) involved in an aircraft accident, for the associated documentation designed to account for the survivors and for interviews by the police officers and accident investigators. Upon receiving the "Crash" message, Terminal Manager will set up the SRC which shall be manned by the airline staff with the police taking charge of the security of the area, i.e. no unauthorized persons shall be allowed in this area. At the SRC, the airline staff shall :

i. Perform head count, briefing and documentation;

ii. Provide care and comfort including refreshments;

iii. Arrange accommodations;

iv. Facilitate the survivors who plan to continue their journey; and

v. Arrange for doctors and/or officers through ECC on need basis.

h. Friends and Relatives Reception Centre (FRRC) :

The FRRC serves as a secure area, away from the attentions of the media, for the friends and relatives of those involved in an aircraft accident. The documentation process within the FRRC helps to confirm who was on the aircraft and facilitates the reunion. On receiving the 'Crash' message, the Terminal Manager will set up the FRRC.

The airline staff shall man the FRRC, and the police shall take charge of the security of the area. At the FRRC, the airline staff shall :

- Attempt to verify the identity of the visitors on entry,
- Conduct documentation and briefing,
- Update Next to Kin (NOK) with the latest information including passenger manifest, that has been officially cleared,
- Provide care and comfort including refreshments,
- Facilitate the NOK's requests or needs,
- Break the news of fatalities to the NOK concerned in the presence of the police and
- Arrange for doctors and/or officers through ECC on a need basis

3.6 TRAINING AND EDUCATION :

Regular training would be provided to all personnel who have a role in planning and operational response to an emergency. The training objectives are :

- To familiarize personnel with the contents and manner of implementation of the plan and its procedures;
- To train personnel in the performance of the specific duties assigned to them in the plan and in the applicable implementation procedures;
- To keep personnel informed of any changes in the plan and the implementing procedures;
- To maintain a high degree of preparedness at all levels of the Emergency Response Organization;
- Train new personnel who may have moved within the facility/ organization;
- Test the validity, effectiveness, timing and content of the plan; and
- Update and modify the plan on the basis of experience acquired through exercises and drills.

3.7 MOCK DRILLS AND EXERCISES :

Mock drills constitute another important component of emergency preparedness and refer to the re–enactment, under the assumption of a mock scenario, of the implementation of response actions to be taken during an emergency. Mock drills and integrated exercises have the following objectives.

- To test, efficacy, timing, and content of the plan and implementing procedures,
- To ensure, that the emergency organization personnel are familiar with their duties and responsibilities by demonstration,
- Provide hands–on experience with the procedures to be implemented during emergency and
- Maintain emergency preparedness

The frequency of the drills would vary depending on the severity of the hazard. However, drills would be conducted once in a year. Scenarios may be developed in such a manner as to accomplish more than one event objective. Drills and exercises will be conducted as realistically as is reasonably practicable. Planning for drills and exercises would include:

- Basic objectives
- Dates, times and places
- Participating organizations
- Events to be simulated
- Approximate schedule of events
- Arrangements for qualified observers and
- An appropriate critique of drills/exercises with participants

Evaluation of drills and exercises would be carried out which include comments from the participants and observers. Discrepancies noted by the drill observers during the drill shall be pointed out. The individual responsible for conducting the drill or exercise would prepare a written evaluation of the drill or exercise. The evaluation would include assessments and recommendations on:

- Areas that require immediate correction;
- Areas where additional training is needed;
- Suggested modifications to the plan or procedures; and
- Deficiencies in equipment, training, and facilities.
- Records of drills, exercises, evaluations, and corrective actions would be duly maintained.

3.8 UPDATING OF DISASTER MANAGEMENT PLAN :

The Disaster Management Plan and implementing procedures would be reviewed and updated to ensure compliance with relevant regulations and applicable state and local emergency plans.

The need for updating is based on following aspects :

- Written evaluations of mock drills exercises which identify deficiencies or more desirable methods, procedures, or organizations;
- Changes in key personnel involved in the organization;
- Changes in the facility organization structure;
- Changes in regulations;

Recommendations received from other organizations and state agencies.

Advantages of Disaster Preparedness and Response Planning :

- Reduces the loss of life and property
- Quick action or response prevents further damage
- Effective disaster preparedness helps alleviate some of the chaos and act sensitively
- Fastens the rehabilitation phase
- Helps further in tackling other emergency like outbreaks, social conflicts, etc
- Planned and coordinated support from all the alliances

❑ **Check Your Progress :**

1. Permanent members of CMC are :

   a. Chief Operating Officer

   b. Head, Security and Head, Airside Management

   c. Terminal Manager

   d. All of the above options

2. ECC acronym stands for _____
   a. Emergency Coordination Centre
   b. Emergency Coordination Centre
   c. Effective Coordination Centre
   d. None of the above examples
3. Mobile Command Post positioned at a distance not less than _____
   a. 30 m b. 50 m c. 70 m d. 90 m
4. Triage Area is normally established at a distance of not less than _____
   a. 50 m b. 100 m c. 150 m d. 200 m
5. In triage casualties are classified into four categories and Delayed Care is _____
   a. Priority I b. Priority II c. Priority III d. Priority IV
6. Survivors Reception Centre is a designated area set up for receiving the _____
   a. Flight Crew b. Flight Attendants
   c. Both a and b options d. None of the above options
7. Planning for mock drills and exercises would include:
   a. Dates, times and places
   b. Participating organizations
   c. Approximate schedule of events
   d. All of the above options
8. Advantages of Disaster Preparedness and Response Planning.
   a. Reduces the loss of life and property
   b. Fastens the rehabilitation phase
   c. Planned and coordinated support from all the alliances
   d. All of the above options

3.9 LET US SUM UP :

Disasters can be caused by nature or man–made. The mental health of people and communities alike depends on being preparing for, responding to, and recovering from disasters and traumatic events. People may have a range of responses to a disaster, many of which are normal reactions to trying circumstances. After a disaster, most people demonstrate resilience. Being resilient means having the capacity to overcome obstacles and persevere under pressure. Despite the fact that everyone responds to disasters differently, some persons impacted may experience severe mental or emotional suffering.

In aviation, disaster preparedness is achieved in part by readiness measures that expedite emergency response, recovery, and rehabilitation

and produce quick, precise aid tactics and plans for being ready that will improve and strengthen emergency response abilities. All the aspects of preparedness and response were covered in this unit for the learner.

3.10 ANSWERS FOR CHECK YOUR PROGRESS :

1. d	**2.** b	**3.** d	**4.** b
5. b	**6.** c	**7.** d	**8.** d

3.11 GLOSSARY :

Disembarkation : It (Disembarkation or debarkation) is the process of leaving a aircraft, or removing goods from a ship or aircraft.

Emergency Response : It includes any systematic response to an unexpected or dangerous occurrence.

Fire Drill : A practice drill in extinguishing fires or in the conduct and manner of exit in case of fire.

Mock Drills : These drills ensure a way of checking the preparedness of facing a disaster.

Next of Kin : It is their closest living blood relative, including spouses and adopted family members.

3.12 ASSIGNMENT :

1. How to categories emergencies in disaster management plan ? Explain with example.
2. Explain the role and responsibility in handling emergency situation at the airport.

3.13 ACTIVITIES :

1. Examine the role and responsibility of various agencies in handling emergencies at airport.
2. Enlist the names of the Crisis Management Centre members name of the nearest airport.

3.14 CASE STUDY :

Case 1 : Ethiopian Airlines Suspends Pilots Who Didn't Respond to Traffic Control

By : Samuel Gebre

Ethiopian Airlines Group suspended a plane crew pending an investigation after they lost communication with air–traffic control in Addis Ababa before later landing safely.

Flight ET343 was en route to the Ethiopian capital from Khartoum in neighboring Sudan on Monday, Africa's largest airline said in a statement. Appropriate action will be taken against the aviators based on the outcome of the investigation.

The pilots had both fallen asleep, according to the Aviation Herald, and were only woken by a warning siren triggered when the autopilot disconnected. They were then able to return the plane to its correct flight path.

Ethiopian airline management quick and prompt response in this situation avoided future disasters by the careless staff working at such a crucial position.

Questions :

1. What do you think sacking of pilot is right decision by the airline to control future accident ?

Case 2 : Poor Response to Disaster : Haiti Earthquake

Haiti is known for the corrupted government. When the earthquake of 7.0 hit the island nation in January of 2010, the government and its people were ill prepared. Between 92,000 and 300,000 people died with many more trapped under rouble. Lacking supplies and leadership, the Haiti government did very little to pull survivors from destroyed buildings. Instead, the Haitian people had to do most of the initial rescue efforts themselves. Even the government was unable to properly distribute the aids received. The efforts of government on providing safe drinking water, reconstruction were very less. Even after the years of earthquake there was no proper concern from the side of the government. The earthquake further pushed the already poor Haiti people much below the poverty line.

Questions :

1. What is your opinion in this case? Should international community come forward to help Haitian from corrupt government or let them be on their condition ?

3.15 FURTHER READING :

1. Disaster Management: Text and Case Studies (2007), D.B.N. Murthy, Deep & Deep Publications
2. Textbook of Disaster Management (2013), Dr Nitesh Kumar, Satish Serial Publishing House
3. Disaster Management: Enabling Resilience (2014), Anthony Masys, Springer Nature

BLOCK SUMMARY

Natural and man–made disasters can happen at any time in aviation sector. A positive reaction to these situations depends heavily on planning and preparation. The four phases of comprehensive emergency management– mitigation, preparedness, response, and rehabilitation up the fundamental structure for disaster planning.

The main goal of prevention is to stop risks from happening. Ev en though some dangers cannot be avoided, the probability of fatalities and serious injuries can be reduced with sound evacuation procedures, planning, and design guidelines.

Planning, organising, training, equipping, exercising, reviewing, and corrective action are all ongoing phases of preparation. The cornerstone of preparedness, which focuses on being ready to respond to any threats, incidents, and emergencies, is training and exercise programmes. A community's capacity to react to a disaster is improved by training and emergency preparedness strategies. The creation of mutual aid agreements and memorandums of understanding, training for emergency responders and concerned people, holding catastrophe drills to refresh training and test capabilities, and launching all–hazards education campaigns are typical preparedness steps.

The response phase comes into play when a major catastrophe or disaster occurs. It comprises of deeds that are intended to prevent death, lessen financial loss, and ease pain. Utilizing the Incident Command System, the reaction phase entails resource management and coordination. The emergency operations centre may be activated, threatened people may be evacuated, mass shelters and care may be provided, emergency rescue and medical care may be provided, fire fighting may be conducted, and urban search and rescue may be conducted.

Mitigation is the process of trying to mitigate the effects of catastrophes and emergencies in order to lessen the loss of life and property. It refers to steps or actions that can stop an emergency from happening, lessen the likelihood that one will occur, or lessen the negative effects of emergencies that cannot be avoided.

In this block all the aspects of disaster management planning are touched very well and nice understanding of topics were created for the learners.

BLOCK ASSIGNMENT

■ **Short Question Answer :**

1. What are the types of disaster, explain them ?
2. Explain the emergency response for enemy action or sabotage ?
3. Define Risk and Risk assessment.
4. Differentiate between reactive and proactive risk management activities.
5. What is Risk Management ?
6. Discuss the advantages of Disaster Preparedness and Response Planning.

■ **Long Question Answer :**

1. What is Disaster Management Plan ? Explain various kind of disaster situation in aviation sector.
2. Explain the process of risk assessment and its steps in detail.
3. How estimation of probability of occurring hazard prepared in aviation industry ?
4. What is the risk matrix and risk assessment in aviation Safety Management System ?
5. Elaborate the Emergency Response Plan and its categorisation.
6. Differentiate between training–education and mock drill in emergency response.

❖ **Enrolment No. :** ☐

1. How many hours did you need for studying the units ?

Unit No.	1	2	3
No. of Hrs.			

2. Please give your reactions to the following items based on your reading of the block :

Items	Excellent	Very Good	Good	Poor	Give specific example if any
Presentation Quality	☐	☐	☐	☐	_____
Language and Style	☐	☐	☐	☐	_____
Illustration used (Diagram, tables etc)	☐	☐	☐	☐	_____
Conceptual Clarity	☐	☐	☐	☐	_____
Check your progress Quest	☐	☐	☐	☐	_____
Feed back to CYP Question	☐	☐	☐	☐	_____

3. Any other Comments

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