7.2 Risk Assessment

Risk Assessment is a systematic process aimed at removing or minimizing hazards at work place to mark it safer and healthier. Risk Assessment involves the following steps:

- Identify hazards;
- Analyze/evaluate the risk associated with hazards(s); and
- Determine appropriate measures to eliminate or control the hazard.

7.2.1 Introduction

Hazard analysis involves the identification and quantification of various probable hazards (unsafe conditions) that may occur at the airport. On the other hand, risk analysis deals with the identification and quantification of risks, the airport equipment/facilities and personnel exposed to, due to accidents resulting from the hazards present at the airport.

Hazard occurrence may result in on-site implications like:

- Fire and/or explosion;
- Leakage of flammable material;
- Crash landing;
- Bomb threat; and
- Natural calamities like earthquake, cyclone etc.

Incidents having off-site origins can be:

- Air raids; and
- Crashing of aircrafts i.e. while landing or take-off.

Other incidents, which can also result in a disaster, are:

- Agitation/forced entry by external group of people;
- Sabotage; and
- Hijacking.

In the sections below, the identification of various hazards, probable risks in the airport operation, maximum credible accident analysis and consequence analysis are addressed either qualitatively or quantitatively, which gives a broad identification of risks involved in the airport operation. Based on the risk assessment of various hazards, disaster management plan has been formulated and presented here.

7.2.2 Hazard Identification

Identification of hazards at the proposed project is of primary significance in the analysis, quantification and cost effective control of accidents. A classical definition of 'hazard' states that hazard is in fact the characteristic of system that presents potential for an accident. Hence, all the components of a system need to be thoroughly examined to assess their potential for initiating or propagating an unplanned event/sequence of events, which can be termed as an accident. The following two methods for hazard identification have been employed in the study:

- Identification of major hazardous units based on Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (as amended in 2000) of Government of India; and
- Identification of hazardous units and segments of airports and storage units based on relative ranking technique, viz. Fire-Explosion and Toxicity Index (FE&TI).

7.2.3 Identification of Major Hazardous Units

Classification of Major Hazardous Substance

Hazardous substances may be classified into three main classes: flammable substances, unstable substances and toxic substances. The ratings for a large number of chemicals based on flammability, reactivity and toxicity have been given in NFPA Codes 49 and 345 M. HSD and ATF will be stored in project premises. Characteristics of HSD and ATF fuel are given in **Table-7.2.**

TABLE-7.2
PROPERTIES OF FUELS TO BE USED AT THE AIRPORT

Fuel	Codes/Label	TLV	FBP	FP	UEL	LEL
		°F			%	
HSD	Flammable liquid	Not listed	360	32	5.0	0.5
ATF	Flammable liquid	Not listed	572	38	7.0	0.2

TLV : Threshold Limit Value *FBP : Final Boiling Point*
FP : Flash Point *UEL : Upper Explosive Limit*
LEL : Lower Explosive Limit

7.2.4 Fuel Storage at the Airport

There are mainly two types of fuel storages at Tirupati airport complex viz: Aviation Turbine Fuel (ATF) for the aircrafts and HSD for the ground service vehicles and DG sets. The existing fuel farm is handled and maintained by M/s. HPCL, which is located within the airport premises.

All the fuels are being stored in the fuel yard located within the airport premises. The fuel is supplied by HPCL and complete fuel is operated and maintained by HPCL. The fuel yard comprises of storages of HSD and ATF fuel. The details of storage capacity are given in **Table-7.3.**

TABLE-7.3
CAPACITY DETAILS OF FUEL STORAGES

Fuel	Total Storage Capacity
HSD	5000 m^3
ATF	6000 m^3

7.2.5 Fire Explosion and Toxicity Index (FE&TI) Approach

Fire, Explosion and Toxicity Indexing (FE & TI) is a rapid ranking method for identifying the degree of hazard. The application of FE&TI would help to make a quick assessment of the nature and quantification of the hazard in these areas.

However, this does not provide precise information. Respective Material Factor (RMF), General Hazard Factors (GHF), Special Process Hazard Factors (SPHF) are computed using standard procedure of awarding penalties based on storage handling and reaction parameters. For each separate storage, which contains flammable or toxic substances, a fire and explosion index 'F' and/or a toxicity index 'T' may be determined in a manner derived from the method for determining a fire and explosion index developed by the Dow chemical company.

- *FE and TI Methodology*

Dow's Fire and Explosion Index (F and E) is a product of Material Factor (MF) and hazard factor (F3) while MF represents the flammability and reactivity of the substances, the hazard factor (F3), is itself a product of General Process Hazards (GPH) and Special Process Hazards (SPH). An accurate plot plan of the Airport/storages, Fire and Explosion Index and Hazard Classification Guide published by Dow Chemical Company are referred to estimate the FE & TI of a storage unit.

The degree of hazard potential is identified based on the numerical value of F&EI as per the criteria given below:

F&EI Range	Degree of Hazard
0-60	Light
61-96	Moderate
97-127	Intermediate
128-158	Heavy
159-up	Severe

- *Toxicity Index (TI)*

The toxicity index is primarily based on the index figures for health hazards established by the NFPA in codes NFPA 704, NFPA 49 and NFPA 345 m.

- *Classification of Hazard Categories*

By comparing the indices F&EI and TI, the unit in question is classified into one of the following three categories established for the purpose as given in **Table-7.4.**

TABLE-7.4
FIRE EXPLOSION AND TOXICITY INDEX

Category	Fire and Explosion Index (F&EI)	Toxicity Index (TI)
I	F&EI < 65	TI < 6
II	65 < or = F&EI < 95	6 < or = TI < 10
III	F&EI > or = 95	TI > or = 10

Certain basic minimum preventive and protective measures are recommended for the three hazard categories.

- *Results of FE and TI for Storage/Process Units*

Based on the MSIHC Rules 1989 (as amended in 2000), the hazardous fuels used at the airport were identified. Fire and Explosion are the likely hazards, which may occur due to the fuel storage. Hence, Fire and Explosion index has been calculated for the storages in the airport premises. Detailed estimates of FE&TI are given in **Table-7.5.**

TABLE-7.5
FIRE EXPLOSION AND TOXICITY INDEX FOR STORAGE FACILITIES

Sr. No.	Fuel	Total Quantity (m^3)	F&EI	Category
1	HSD	5000	64.02	I (Moderate)
2	ATF	6000	76.33	II (Moderate)

7.2.6 Risk Quantification - Fuel Storage

Based on the storage of fuels and their properties, the following failure scenarios for the airport have been identified for quantification of risk, which are given in **Table-7.6.** The heat radiation contours are calculated around the source of failure to assess the extent of damage.

TABLE-7.6
SCENARIOS CONSIDERED FOR MCA ANALYSIS

Sr. No.	Fuel/Chemical	Total Quantity (m^3)	Model Considered
1	Failure of HSD storage tank	5000	Pool Fire
2	Failure of ATF storage tank	6000	Pool Fire

For the present study, the scenarios under consideration assume that the peak level of radiation intensity will not occur suddenly. Based on the past experience, it is found that 20-30 minutes time will be required before a tank fire grows to full size. For radiation calculations, pool fire has been considered. From the above considerations, the criterion of 4.5 kW/m^2 has been selected to judge acceptability of the scenarios. The fuel properties used for modeling are tabulated in **Table-7.7** and are compiled from various literatures.

TABLE-7.7
PROPERTIES OF FUELS CONSIDERED FOR MODELING

Sr. No.	Fuel	Boiling Point	Density
		^oF	kg/m^3
1	HSD	360	830
2	ATF	572	845

7.2.7 Model Computations

The results of MCA analysis for ATF and HSD are tabulated indicating the distances for various damages identified by the damage criteria. Calculations are done for radiation intensities levels of 37.5, 25, 19, 12.5, and 4.5 kW/m^2 which are

presented in **Table-7.8** for instantaneous pool fire. The distances predicted for various scenarios are given in meters and are from the center of the pool.

TABLE-7.8
OCCURRENCE OF VARIOUS RADIATION INTENSITIES - POOLFIRE

Failures	Storage Capacity (m^3)	Radiation Intensities (kW/m^2)/Distances (m)					
		37.5	**25.0**	**19.0**	**12.5**	**4.5**	**1.6**
HSD Tank	5000	34.1	45.7	52.9	67.5	112.9	189.8
ATF Tank	6000	30.6	39.8	48.6	60.6	104.3	156.4

- ***Pool Fire Due to HSD Tank Failure***

A perusal of the above table clearly indicates that 37.5 kW/m^2 (100% lethality) and 25.0 kW/m^2 (50% lethality) occurs at 35.2 m and 47.2 m respectively. Similarly, the threshold limit for 0% lethality with 1st degree burns is 4.5 kW/m^2 and thermal radiation contour of 1.6 kW/m^2 will occur at a distance of 189.8 m. Therefore, the potential failure of HSD will only have effect on the activities falling within the premises.

- ***Pool Fire Due to ATF Tank Failure***

Similarly, a perusal of the above table clearly indicates that 37.5 kW/m^2 (100% lethality), 25.0 kW/m^2 (50% lethality), 12.5 kW/m^2 (1% lethality) and 4.5 kW/m^2 (0% lethality with 1st degree burns) will be occurring at a distance of 30.6 m, 39.8 m 60.6 m and 104.3 respectively. The thermal radiation of 1.6 kW/m^2 (No Discomfort even after long exposure) will occur at a distance of 156.4 m. Therefore, the impact on the airport surroundings is practically insignificant.

7.2.8 Risk Mitigation Measures

The risk mitigation measures for the proposed airport are as given below:

- Prompt action in the event of an accidental release of HSD or ATF is essential. Where there is a possibility of a flammable liquid spill, provisions shall be made to ensure as follows: (i) the spread of the spill is limited; (ii) non-flammable absorbent material is available for immediate use; (iii) ignition sources can be quickly removed; and (iv) the area is well ventilated;

- Routine testing and inspection shall be carried out for storage area, hoses and fuelling tanker and records shall be maintained;

- Leakages from tanker may be prevented by a suitable regime of preventive maintenance and inspection;

- Heat and smoke detectors shall be provided at strategic locations;

- Adequate fire fighting facilities shall be provided near storage and handling of HSD and ATF;

- Fire fighting facilities shall be tested as per schedule;
- Ground staff near aircraft shall be trained to take measures in the event of spillage and during fire emergency;
- Fuelling in aircraft and DG sets 'day tank' shall be done under the supervision of trained operators;
- Open vents shall be provided of goose neck type, covered with a 4 to 8 mesh screen to discharge the vapours of hydrocarbons from storage tanks;
- Every storage tank and tanker, including all metal connections shall be electrically continuous and be effectively earthed;
- Static grounding of aircraft shall be ensured whenever the aircraft is parked including during refuelling and defueling;
- Check list for operators for checking safety system and equipment shall be prepared and check records kept in safe custody;
- Critical operating steps shall be displayed on the board near the location where applicable;
- Thermal Safety Valve (TSV) shall be provided at the operating manifold (outside dyke);
- Mock drill shall be conducted in every three months involving all concerned agencies; and
- All concerned agencies shall be provided Disaster Management Plan and regular interaction shall be made.

Risk Mitigation Measures for Fuelling of Aircrafts

- Earthing and bonding connections shall be attached and mechanically firm;
- Equipment performing aircraft servicing function shall not be positioned within 3 m radius of aircraft fuel vent openings;
- The accessibility to the aircraft by fire vehicles shall be established during aircraft fuel servicing;
- Handheld intrinsically safe communication devices used within 3 m from the fuel vent shall be intrinsically safe;
- For open hose discharge capacity of the aircraft fuelling system, at least one listed wheeled extinguisher having a rating of not less than 80-B;
- Presence of at least 2 x 9 kg ABC dry powder fire extinguishers at both sides of the refuelling browser / dispenser;
- Spark plugs & other exposed terminal connections shall be insulated;

- All vehicles, other than those performing fuel servicing, shall not to be driven or parked under aircraft wings;
- Electric tools, drills or similar tools likely to produce sparks or arcs shall not be used;
- Hot works within 50 / 75 m of refuelling operations shall be ceased (for 50 m, a MOM approved safety officer shall be present); and
- A clear area for emergency evacuation of the aircraft shall be maintained at the rear (or front) aircraft exit door.

7.2.9 Effect of Thermal Radiation on Population

A perusal of Table-7.7 presented in above section indicates that radiation contours (37.5 kW/m^2 and 25 kW/m^2) are restricted to airport boundary only and do not affect the surrounding human population.

In addition, the airport has watch towers to keep vigilance on all the activities occurring. The traffic movement is recorded by the security personnel. In case of any eventuality, the alarm is blown to alert the nearby work force.

The Passenger Terminal Building (PTB) has adequate fire rescue system comprising of fire hydrants, emergency exits, and assembly points for safety of the occupants.

7.3 Disaster Management Plan

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.

The emergency arising out of the incidents whose effects are confined to the airport premises is termed as on-site emergency and those with effects extending beyond the airport premises is termed as off-site emergency. This section identifies possible disasters that could occur at the airport and draws a disaster management plan, which includes the emergency control measures, plan of coordination and interaction with various agencies including administrative agencies, rescue and relief operations, training and awareness to minimize the severity of disasters.

The DMP plan should be prepared in accordance with the Civil Aviation requirement laid down by the Director General of Civil Aviation (DGCA), the National Disaster Management Act, 2005, the National Building Code as well as various code provisions of the International Civil Aviation Organization (ICAO) Airport Service Manual, Part-7. The following most likely disaster scenarios shall be considered in the management plan.

7.3.1 Aerodrome Emergency Plan (AEP) for Disaster Management

A comprehensive Aerodrome Emergency Plan is already in place. The AEM plan is comprehensively prepared for specifying role of various groups / organizations/ agencies and plan of disaster management during various types of emergencies / disasters like in-flight mass casualties, medical emergencies, aircraft accidents, various fires on ground, accidents involving dangerous goods, natural disaster management, unlawful act of seizure of aircraft etc. The following most likely disaster scenarios are considered in the Aerodrome Emergency Plan.

- Plan Development And Maintenance

This Emergency Response Plan has been developed to facilitate the timely and appropriate response to emergencies occurring on or in the immediate vicinity of the airport. The principal goals of this plan are to render necessary assistance and minimize further injury and damage to persons and property involved in accidents or emergency situations at the airport.

Personnel should periodically review AEP policies, procedures, and related information. Training that covers changes in policies, procedures, resource availability, etc. should be provided to ensure that all personnel stay familiar with current information.

Schedule of Review

A schedule should be developed for reviewing each part of the AEP. A suggested schedule for some of the key elements is:

- ✓ Telephone numbers contained in the AEP should be reviewed quarterly for accuracy by actually calling the individuals/organization listed. Changes should be noted, particularly in the procedures of the individual(s) /organization(s) tasked with making the calls during an emergency;
- ✓ Radio frequencies used in support of the AEP should be tested at least monthly;
- ✓ Emergency resources should be inspected routinely;
- ✓ Personnel assignments to include descriptions of duties and responsibilities should be reviewed semi-annually;
- ✓ Mutual aid agreements should be reviewed annually or as specified in the Agreement;
- ✓ Off-airport activity should be reviewed on an on-going basis. Maintain open dialogue with off-airport agencies, such as utilities, public works departments, etc. to learn of activity that may affect the airport's emergency response effort, i.e. road construction and closures, major utility work, etc.

❖ *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 shall 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;
- Date, time and venue;
- 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;
- Deficiencies in equipment, training, and facilities; and
- Records of drills, exercises, evaluations, and corrective actions would be duly maintained.

❖ <u>Plan Development For Specific Hazards</u>

This section focuses on the special planning needs of the particular hazards that airports may encounter. It addresses the essential operational actions that must be accomplished to facilitate the successful completion of a specific response function. Some of the hazards that may require response are:

✓ Aircraft incidents and accidents;
✓ Natural disasters;

- ✓ Bomb incidents;
- ✓ Hazardous materials incidents;
- ✓ Structural fires; and
- ✓ Failure of power for movement area lighting.

❖ Aircraft Incidents and Accidents

Aircraft accident is any occurrence associated with the operation of an aircraft that takes place between the time a person boards the aircraft with the intention of flight and the time such person has disembarked, in which a person suffers death or serious injury as a result of the occurrence or in which the aircraft receives substantial damage.

Aircraft incident is any occurrence associated with the operation of an aircraft that is not considered and "aircraft accident."

➢ **Incident Classification System**

Level 1: Accident may happen. Landing Gear Problem. A situation or emergency exists or is perceived to exist, that may result in an incident or accident. This includes situations where it is not known if an incident or accident emergency has actually occurred;

Level 2: An aircraft is known or suspected to have an operational defect that affects normal flight operations to the extent that there is danger of an accident; and

Level 3: An aircraft accident has occurred on or in the vicinity of the Airport.

Response: The Airport Director

Responsible for all areas of the airport and areas of approach off airport property used by aircraft for landing at the airport. Airport staff will coordinate with all agencies involved to ensure the quick and efficient response to the emergency.

Level 1 Classification Response

The Aircraft Rescue Fire Fighter (ARFF) personnel should be advised of the following information if known:

- ✓ Type of aircraft;
- ✓ Type and amount of fuel;
- ✓ Number, or potential number, of passengers and crew;
- ✓ Nature of emergency; and
- ✓ Number of injured passengers on board.

Level 2 Classification Response

- ✓ ARFF personnel should be provided with the same information as above plus any additional details that will allow preparation for likely contingencies.

Fire/police dispatch should advise Airport Staff of the applicable Fire department radio talk group or provide a radio patch to facilitate efficient response coordination. A full response should be made with the emergency equipment manned and positioned with engines running and all emergency lights operating so rapid response to the incident / accident site can be accomplished;

- ✓ Standby locations on the airport should be accessed through the terminal apron gates and responding units should position themselves in such a manner as to have a clear view of the runway and taxiways. The person in charge of response equipment (Fire Department) should anticipate the aircraft's rollout and station emergency response vehicles some distance up wind from the rollout area;

- ✓ Communication with aircraft by airport staff (on unicom frequency) and passed to the fire department. This provides a safety factor for rollout and should an emergency require, the vehicle could be on the move to the aircraft stopping point from an upwind direction; and

- ✓ The ARFF vehicle shall move on a fast parallel course to the aircraft once it is apparent that the aircraft is going to pass the standby position.

Level 3 Classification Response

- ✓ Full ARFF procedures should be put into effect. All pertinent updated information should be relayed by the airport staff and or dispatching agency to responding emergency units and include the location of the accident using direction and distance from the terminal building, thresholds, mid-field, street/road intersections or landmarks (creeks, businesses, etc);

- ✓ When complete aircraft related information is not available, the ARFF personnel should anticipate the worst situation and prepare accordingly; and

- ✓ Notify the FAA operations center of conditions at the site, particularly if such conditions could interfere with flight operations. Airport Staff should issue applicable NOTAMS and ensure appropriate Unicom advisories are communicated.

If the accident involves personal injury/death, the wreckage cannot be moved or disturbed until so authorized by the FAA duty officer. Following FAA authorization, the wreckage may be moved away from the runway/taxiways system so as to facilitate the timely reopening of the airport. The aircraft owner is responsible for removing the damaged aircraft. The airport FBO and transportation department shall assist as required in this recovery process.

Following removal of the wreckage, an airport operations representative shall inspect the runway/taxiways pavement surfaces for damage/debris, and if satisfactory, the airport reopened to air traffic.

- **Fire Department**

The fire chief or senior fire department representative on the scene will be the incident commander and will direct all efforts of fire suppression and the rescue of individuals involved in the incident. The Incident Commander will assess the situation and ensure that adequate equipment is available for rapid-fire suppression, rescue of victims and transportation of victims to area hospitals. The scene incident commander will maintain contact with the airport director.

Fire/police dispatch should advise airport staff of the applicable fire department radio talk group or provide a radio patch to facilitate efficient response and coordination. (i.e. directions to the emergency site / recommended access gate, etc).

- **Police Department / Department of Public Safety (DPS)**

The Police Department / Sheriff Department will secure the area and ensure the free flow of emergency equipment into the incident scene. The Police Department / Sheriff Department will be responsible for crowd control, site security, and control of ingress and egress to the incident scene by authorized personnel. Law Enforcement personnel shall assist fire fighters in the suppression of fire and rescue of victims if requested by the Incident Commander. The accident / incident scene shall be treated as a major crime scene and secured as such.

- **Public Works Department**

The public works department shall respond to any serious aircraft or airport incident. The director of public works will assist the airport director in returning the airport to normal operations in an expeditious manner. The director of public works will assist in and supervise the recovery, removal or salvage of property that creates a problem on the airport and restricts aircraft operations. This shall include the removal of aircraft on runways or taxiways, removal of debris of a hazardous nature on runways and taxiways. The Public Works Department should respond with initial necessary equipment to accomplish their mission. This may include:

- ✓ Front end loader;
- ✓ Dump truck;
- ✓ Flatbed trailer;
- ✓ Sweeper;
- ✓ Adequate cables and ropes to move an aircraft; and
- ✓ Support equipment (i.e. barricades, cones, and lighting systems for night recovery operations).

- **Public Information Office**

Airport personnel or other city personnel should not make any statements to the news media during an emergency situation at the airport or aircraft accident scene unless previously directed. The Airport Director, Public Information Officer and a representative from the FAA will normally serve as the press liaison. The

AEP should include directions on dealing with press inquiries. Any employee having a question concerning inquiries from the media regarding the airport or an aircraft incident shall refer the media to the Assistant City Manager, Public Information Officer or the Airport Director.

- **Airport Tenants**

Airport tenants and their employees should be considered as a prime source of readily available equipment and manpower that may have intimate knowledge of the airport and the aircraft. They can be invaluable, especially if their background includes aircraft maintenance, medical training, or is transportation related. If utilized, on a voluntary basis only, it is imperative that these persons be deployed under supervision and assigned specific functions to avoid duplication of efforts and the possibility of disrupting the other emergency operations.

7.3.1.1 Natural Disasters

In the event of a natural disaster such as tornadoes, hailstorms, flooding, severe thunder storms, high winds, or other natural disasters, the emergency management plan and the hazardous weather emergency operations plan will be followed. The NOAA weather radio should be monitored to ascertain the conditions that will affect the airport.

The possible natural calamities that can affect airport, are earthquake (seismic zone-III) and torrential rains resulting water logging. The various actions procedures recommended are in compliance with "The National Disaster Management Act 2005' and various regulations laid down by ICAO and DGCA.

- ✓ In case of any major natural disaster, especially earthquake, resulting major loss in terms of life and property, the incident command system of State Disaster Management Authority (SDMA) shall be set up at the airport; and

- ✓ To contain a developing scenario, the Aerodrome Emergency Management Committee (AEMC) chaired by the Deputy Commissioner, Tirupathi shall be synchronized with the incident command system (ICS) of SDMA and airport operator shall provide all possible support to the state machinery.

Response: Airport Director

- ✓ Establish an Operations Center (OC) in the terminal building to coordinate any airborne emergency relief at the direction of the transportation director;
- ✓ Coordinate with all military and relief flight operations for the orderly flow of air traffic;
- ✓ Designate unloading areas and the movement from the airport of relief supplies;
- ✓ Provide current weather information to the city manager, police chief, fire chief, emergency management staff and utility departments; and
- ✓ The airport director will have the option of designating a staff person to man the EOC in his absence.

7.3.1.2 Bomb Incidents

Sabotage including Bomb Threat and Unlawful Seizure of Aircraft

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 300 m 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; and

- Conduct regular training of airport security police and staff, airline agencies working at the airport. This training is based for identification of explosives.

A separate contingency plan for emergencies involving aircraft or not involving aircraft for sabotage including bomb threat incorporated in the security manual and same shall be referred as and when such emergency arise.

7.3.1.3 Hazardous Material Emergencies

Fuel Spillage

This emergency situation involves the possible spillage of hazardous material on a commercial, military or private aircraft in flight. The fuel spill is categorized as

minor and major spill. If the spill, covering an area of 4 m^2 or quantity exceeding 20 liters or if in the opinion of duty manager of ARFF, spill constitutes a serious hazard (considering the location and its proximity to heat source) is classified as major spill.

Response: Airport Director

The actions taken will be:

- ✓ Upon landing the pilot will be directed to an isolation bay. Fire equipment and ARFF vehicle will remain upwind of the isolation bay;
- ✓ A perimeter will be established around the area with a 1500-foot minimum distance from the aircraft;
- ✓ Only rescue crews and authorized personnel will be permitted within the perimeter if radioactive perimeter if radioactive smoke borne or wind carried particles are present;
- ✓ Close doors and windows of buildings in the area where blowing smoke borne or other particles are present. Evacuate the area immediately;
- ✓ Determine if an actual spillage has occurred. If the radioactive container or hazardous material container is found to be unbroken, the alert will be cancelled. The material container is found to be unbroken, the alert will be cancelled. The material will be held in custody until proper disposal instructions are received; and
- ✓ If a spillage has occurred, the fire department and the senior fire official on scene will take charge and become the incident commander. Fire department shall direct all containment and cleanup operations.

7.3.1.4 Structural Fire

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. 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.

Response: Airport Director

- ✓ Take protective actions for employees and public;
- ✓ Evacuate area according to BCAS approved evacuation plan;
- ✓ Coordinate response activities;
- ✓ Control access to facility until it has been inspected and/or will not impede with Emergency response organisations; and
- ✓ Coordinate news releases, if necessary.

Airport Staff/ Maintenance

- ✓ Assist with critical services including utility support (activation/cutoff) as needed;
- ✓ Provide safety inspections; and
- ✓ Assist in restoration of facility.

Fire Department

The Fire Chief or Senior Fire Department representative on the scene will be the Incident Commander and will direct all efforts of fire suppression and the rescue of individuals involved in the incident. The Incident Commander will assess the situation and ensure that adequate equipment is available for rapid-fire suppression, rescue of victims and transportation of victims to area hospitals. The Scene Incident Commander will maintain contact with the Airport Director. Fire/police dispatch should advise Airport Staff of the applicable Fire Department radio talk group or provide a radio patch to facilitate efficient response and coordination. (i.e. directions to the emergency site / recommended access gate, etc).

Police Department / Department of Public Safety (DPS)

The Police Department / DPS will secure the area and ensure the free flow of emergency equipment into the incident scene. The Police Department / DPS will be responsible for crowd control, site security, and control of ingress and egress to the incident scene by authorized personnel. Police personnel shall assist fire fighters in the suppression of fire and rescue of victims if requested by the Incident Commander. The accident / incident scene shall be treated as a major crime scene and secured as such.

7.3.1.5 Structural Fire

This emergency situation involves failure of power for movement area lighting.

Response: Airport Director

- ✓ Notify staff and repair personnel of power outage;
- ✓ Issue NOTAM, if required; and
- ✓ Startup generator.

7.3.2 Role and Responsibility in Handling Emergencies

Following are some of the responsibilities of different organizations that may be involved in the event of an airport emergency.

TABLE-7.9
ASSIGNMENT OF RESPONSIBILITIES

Sr. No	Service	Responsibilities
1	Air Carrier/Aircraft Operator	✓ Provide full details of aircraft related information, as appropriate, to include number of persons, fuel, and dangerous goods on board ✓ Coordinate transportation, accommodations, and other arrangements for uninjured passengers ✓ Coordinate utilization of their personnel and other supplies and equipment for all types of emergencies occurring at the airport
2	Airport Authority/Management	✓ Overall Scene Incident Commander. Assumes responsibility for all overall response and recovery operations, as appropriate ✓ Establish, promulgate, coordinate, maintain, and implement the AEP ✓ Coordinate the closing of the airport when necessary and initiate the dissemination of relevant safety-related information to the aviation users NOTAMS (notices to man)
3	Airport Tenants	✓ Coordinate the use of their available equipment and supplies ✓ Coordinate the use of their manpower. The tenants usually have knowledge of the airport, aircraft, and other technical knowledge
4	Communications Services	✓ Identify and designate private and public service agencies, personnel, equipment, and facilities that can be used to augment the airport's communications capabilities ✓ Identify repair capability and availability under emergency conditions ✓ Coordinate and establish communications protocols, including frequency utilization, for use during emergency conditions
5	Emergency Management Agencies	✓ Coordinate local Emergency Operations Plans (EOP) with the AEP ✓ Consider role airport may have in support of state or regional defence or disaster response plans
6	Emergency Medical Services	✓ Provide emergency medical services to the airport during emergency conditions to include triage, stabilization, first aid, medical care, and the transportation of injured ✓ Coordinate planning, response and recovery efforts with hospitals, fire and police departments, airport operator, etc.
7	State or Local Environmental Agency	✓ Provide response and recovery support for environmental and other hazardous material emergencies as defined by statute
8	Federal Aviation Administration (FAA)	✓ Certify and monitor the practices and procedures of the aviation industry ✓ Provide investigation services, as necessary
9	Federal Bureau of Investigation (FBI)	✓ Investigate any alleged or suspected activities that may involve federal criminal offenses

Sr. No	Service	Responsibilities
		✓ Assumes command in response to certain hijack and other criminal situations
10	Aircraft Rescue and Fire fighting	✓ 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; and ✓ Support for mitigation and dangerous floods, accidents/incidents
11	Government Authorities	✓ Post-accident investigation, unlawful seizure of aircraft, bomb threats and bombings may fall into jurisdiction other than that of the airport authority
12	Hazardous Materials Response Team	✓ Provide response and recovery support for hazardous material emergencies as defined
13	Health and Medical	✓ Coordinate overall planning, response, and recovery efforts with hospitals, EMS, fire and police departments, airport operator, etc. to ensure practicality and interoperability.
14	Hospital	✓ Coordinate the hospital disaster plan with the airport and community EOP
15	Mutual Aid Agencies	✓ Coordinate and integrate emergency services into the AEP through mutual aid agreements and Standard Operating Procedures (SOPs) ✓ In some locations there are regulations or laws governing mutual aid activities and agreements
16	National Weather Service	✓ Provide related technical support information in support of emergency response and recovery operations ✓ Assist with alert and warning processes, particularly with weather related emergencies
17	National Transportation Board (NTSB)	✓ Conduct and control all accident investigations involving civil aircraft, or civil and military aircraft, within the United States, its territories and possessions
18	Police/Security	✓ Manage law enforcement resources and direct traffic control and law enforcement operations
19	Public Information/Media	✓ Gather, coordinate and release factual information
20	Public Works/Engineering	✓ Manage public works resources and direct public works operations (e.g. road maintenance, debris/trash removal, etc.) ✓ Coordinate with private sector utilities (e.g. power and gas) on shutdown and service restoration ✓ Coordinate with private sector utilities and contractors for use of private sector resources in public works-related operations

7.4 Operation and Management Control

7.4.1 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;
- Department of information and publicity;
- Representative from local NGO's and social group; and
- 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.

7.4.2 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 centres 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 of emergency situations. The main features of this unit will be:

- 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 for 24 hours; and