CHAPTER – 7

ADDITIONAL STUDIES

7.1 Risk Assessment & Disaster Management Plan

7.1.1 Introduction

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

Hazard occurrence at the Kolhapur Airport after proposed development may result in on-site implications, like:

- Storage of HSD for DG sets operation in barrels;
- Leakage of flammable materials, like, HSD followed by fire;
- Bomb threat at terminal building, cargo terminal and aircraft; and
- Natural calamities like, earthquake, cyclone, high winds, etc.

Other incidents, which can also result in a disaster at the new terminal building at Kolhapur Airport after proposed development, are:

- Agitation/forced entry by external group of people; and
- Sabotage;
- Air raids; and
- Crashing of aircrafts *i.e.* while landing or take-off.

Risk analysis follows an extensive hazard identification and analysis. It involves the identification and assessment of risks to the people exposed to hazards present. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of populations, etc. For emergency response planning, risk analysis is carried out for worst case scenarios.

7.1.2 Approach for the Risk Analysis

Risk involves the occurrence or potential occurrence of various type accidents consisting of an event or sequence of events. The risk analysis assessment study covers the following:

- Identification of potential hazard areas;
- Identification of representative failure cases;
- Visualization of the resulting scenarios in terms of fire and explosion;
- Assess the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios;
- Assess the overall suitability of the site from hazard minimization and disaster mitigation points of view;
- Furnish specific recommendations on the minimization of the worst accident possibilities; and
- Preparation of disaster management plan (DMP), on-site and off-site emergency response plan.

7.1.3 Hazard Identification

Preliminary hazards analysis is based on the philosophy *"Prevention is better than cure"*.

Identification of hazards at the Kolhapur Airport after proposed development is of primary significance in the risk 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. Hazard identification has been carried out in the purview of following:

- Identification of hazards based on Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (as amended in 2000); and
- Identification of hazards due to handling and storage of HSD based on

qualitative/quantitative techniques.

7.1.4 Tank farm Details for fueling of Aircraft and Ground Support Vehicles

Airport Authority of India will not be engaged in fueling of Aircraft and Ground Support Vehicles. Petroleum Oil Public Sector Companies like IOCL, BPCL and HPCL will be engaged in fueling of Aircraft and Ground Support Vehicles. Storage and handling of ATF and High Speed Diesel (HSD) by Oil companies are carried by PESO and OISD guidelines. These ATF and High Speed Diesel storage and handling facilities will have approval from PESO.

7.1.5 Identification of Hazards Due to Storage of HSD and ATF

At the airport, HSD is stored and handled for DG sets operation while ATF will be stored for refueling of aircraft. It is essential to have comprehensive information on High Speed Diesel (HSD) and Aviation Turbine Fuel (ATF) to be handled at the Kolhapur Airport after proposed development. An understanding of their physico-chemical properties of HSD and ATF will help for hazard identification.

High Speed Diesel (HSD)

High speed diesel is a mixture of straight run product (150 °C and 350 °C) with varying amount of selected cracked distillates and is composed of saturated hydrocarbons (primarily paraffins including iso, and cycloparaffins), and aromatic hydrocarbons (including napthalenes and alkylbenzenes). Its exact composition depends on the source of crude oil from which it is produced and the refining methods used.

Physical properties of high speed diesel are as given below:

Boiling point/Range	: 215 – 376 ^{o}C
Physical state	: Liquid
Appearance	: Yellowish Brown
Vapour pressure	: 2.12 to 26mm Hg at 21 ^{o}C
Odour	: Perceptible odour
Solubility in water @ 30 deg.C	: Insoluble
Specific gravity	: 0.86 - 0.90 at 20 °C

Pour Point	: 6 - 18 °C
Flammability	: Yes
LEL	: 0.6%
UEL	: 6%
Flash point (deg C)	: 32 (°C)
TDG Flammability	: Class 3
Auto Ignition Temp	**:** 225 °C

HSD presents a moderate fire hazard. On heating, it can cause pressure rise with risk of bursting and subsequent explosion. It also forms explosive mixture with air particularly in an empty container

Aviation Turbine Fuel (ATF)

Aviation Turbine Fuel (ATF) is clear colourless to yellow liquid with slight petroleum odor. It is flammable liquid and highly flammable in presence of open flame and spark. The flammability of ATF is ranked as 2 by National Fire Protection Association (NFPA).

Physical and chemical properties of ATF are as given below:

Boiling Point	: 160°C
Specific Gravity	: 0.81 (Water = 1) at 15.6 ^{o}C
Vapor Pressure	: 1 kPa (@ 37.8°C)
Vapor Density	: 5.7 (Air = 1)
Auto-Ignition Temperature	: 210°C
Flash Points	: 38°C
Flammable Limits	: Lower: 0.7% Upper: 5 %
Viscosity	: 8 cSt @ -20.0 °C
Solubility	: Low PPM range in water

7.1.6 Identification of Hazards Based on MSIHC Rule, 2000

Manufacturing, Storage, Import of Hazardous Chemicals Rules, 1989 (amended in 2000) has been enforced by Govt. of India under Environment (Protection) Act, 1986. For the purpose of identifying hazard installations the rules employ certain criteria based on toxic, flammable and explosive properties of chemicals. MSIHC

Rule will be applicable for storage of HSD and ATF at the Kolhapur Airport after proposed development.

7.1.7 Hazardous Conditions

An accidental release of HSD for DG operation and ATF from tanks or piping during unloading and filling in aircraft may result in formation of fixed or spreading pool of released qualities. In case of immediate ignition, a pool fire will result. Delayed ignition may result in explosion or flash fire, if quantity of explosive mass is sufficient and some confinement is present.

Pool Fire

A leak or spill of sufficient quantities of petroleum product will result in an accumulation of petroleum product on the ground. If ignited, the resulting fire is known as spreading or fixed pool fire. In case any object comes in contact with the flame above the pool, it will be severely damaged or destroyed and personnel exposed to flame will suffer extensive burn injuries. Objects and personnel outside the actual flame volume may also be affected or injured by radiant heat. The extent of damage or injury depends on the heat flux and duration of fire and exposure. If a large area of the body receives second and third degree burns, it can result in fatalities.

The extent of injury to people depends on the heat flux and duration of exposure. The extent of damage to personnel and property depends on the size of the pool and the duration of fire.

Thermal Effects

In case of fire, thermal effect is likely to cause injury or damage to people and objects. A substantial body of experimental data exists and forms the basis for thermal effect estimation. The consequence caused by exposure to heat radiation is a function of:

- Radiation energy onto the human body [kW/m^2];
- Exposure duration [sec];
- Protection of the skin tissue (clothed or naked body).

The following damage distances for thermal radiation have been used:

37.5 kW/m^2 **:** Damage to process equipment. 100% fatality in 1 min. 1% fatality in 10 sec.
12.5 kW/m^2 **:** First degree burn for 10 sec. exposure
4.0 kW/m^2 **:** First degree burn for 30 sec. exposure

Vapour Cloud Explosion/Flash fire

Vapour cloud explosion scenarios have been considered for confined (over pressure scenario) as well as non-confined scenario (flash fire).

If a released HSD and ATF are not ignited immediately, the vapour cloud will spread in the surrounding area towards wind direction. The drifting cloud will mix with air. As long as the vapour concentration is between the lower and upper explosion limits, the vapour cloud may be set on fire by an ignition source. In case of delayed ignition of a vapour cloud, two physical effects may occur: a flash fire (non-confined) over the whole length of the flammable vapour cloud; a vapour cloud explosion (confined) which results in blast wave, with typical peak overpressures circular around the ignition source. For generation of overpressure effects, some degree of confinement of the flammable cloud is required. The extent of injury to people & damage to property or environment depends on the cloud size, explosive mass in the cloud and the degree of confinement at the time of ignition.

Delayed Ignition & Explosion

In case of delayed ignition of a natural vapour cloud, two physical effects may occur:

- A flash fire (non confined explosion) over the whole length of the explosive vapour cloud;
- A vapour cloud explosion (confined explosion) that results in blast wave, with typical peak overpressures circular around the ignition source. For generation of overpressure effects, some degree of confinement of the flammable cloud is required.

The following **Table 7.1** gives damage criteria with respect to the peak overpressures resulting from a blast wave:

Table 7.1 Damage Effects due to Overpressures

Peak Overpressure	Damage Type
0.830 bar	Total Destruction
0.350 bar	Heavy Damage
0.170 bar	Moderate Damage
0.100 bar	Minor Damage

The **Table 7.2** below gives an illustrative listing of damage effects caused by peak overpressure.

Table 7.2: Illustrative Damage Effects due to Overpressures

Peak Overpressure (Bar)	Failure
0.005	5 % Window Shattering
0.02	50 % Window Shattering
0.07	Collapse of a roof of a tank
0.07-0.14	Connection failure of panelling
0.08-0.1	Minor Damage to Steel Framework
0.15-0.2	Concrete block wall shattered
0.2	Collapse of Steel Framework
0.2-0.3	Collapse of self framing Steel panel building
0.2-0.3	Ripping of empty oil tanks
0.2-0.3	Deformation of a pipe bridge
0.2-0.4	Big trees topple over
0.3	Panelling torn off
0.35-0.4	Piping failure
0.35-0.8	Damage to Distillation Column
0.4-0.85	Collapse of pipe bridge
0.5	Loaded Train Wagon overturned
0.5	Brick walls shattered
0.5-1.0	Movement of round tank, failure of connecting piping

(Source: TNO)

7.1.8 Maximum Credible Accident Analysis (MCAA)

At the Kolhapur Airport after proposed development, HSD and ATF may be released as a result of failures of hose pipe used for loading and unloading or catastrophic rupture of pipe or pipe connection, causing possible fire and explosion resulting damage human and property in the surrounding area. This section deals with the question of how the consequences of the release of such substances and the damage to the surrounding area can be determined by means of models. Maximum Credible Accident analysis encompasses certain techniques to identify the hazards and calculate the consequent effects in terms of damage distances of heat radiation, vapor cloud explosion, etc. Depending upon the effective hazardous attributes and their impact on the event, the maximum effect on the surrounding environment and the respective damage caused can be assessed.

The Kolhapur Airport after proposed development may mainly pose flammable and explosion hazards due to unwanted release or leakage of HSD and ATF. Consequence analysis is basically a study of quantitative analysis of hazards due to various failure scenarios. It is that part of risk analysis, which considers failure cases and the damage caused by these failure cases. It is done in order to form an opinion on potentially hazardous outcome of accidents and their possible consequences. The reason and purpose of consequence analysis are many folds like:

- Estimation of consequence distances;
- Design Criteria.
- Protection of other installations; and
- Emergency Planning;

The results of consequence analysis are useful for getting information about all known and unknown effects that are of importance when some failure scenario occurs and also to get information as how to deal with the possible catastrophic events.

7.1.9 Scenarios Considered for Consequence Analysis

HSD will be stored in barrels as per Oil Industry Safety Directorate (OISD), therefore, possibility of fire and explosion in barrel is negligible. The selected scenarios for consequence calculations are given in **Table 7.3**.

Table 7.3: Selected Scenarios for Consequence Calculations

Scenario No.	Description	Outcomes
1.	Leakage of HSD from barrels followed by Immediate/ delayed ignition	Pool Fire/ Vapour Cloud Explosion/ Flash Fire
2.	Leakage during filling of ATF in Aircraft followed by Immediate/ delayed ignition	Pool Fire/ Vapour Cloud Explosion/ Flash Fire
3.	ATF Tanker on fire	Pool Fire/ Vapour Cloud Explosion/ Flash Fire

Note: Vapour Cloud Explosion (Confined) and Flash Fire (Non-confined)

Model Used For Consequence Analysis

The consequence analysis studies involve a large number of calculations for which established computing aids are essential. PHAST software of DNV has been used to perform the consequence calculations. PHAST is a consequence and risk assessment software for calculation of physical effects (fire, explosion, atmospheric dispersion) of the escape of hazardous materials. PHAST software allows detailed modelling and quantitative assessment of release of pure and mixtures of liquid and gaseous chemicals.

7.1.10Consequence Analysis

Scenario-1: Leakage of HSD from barrels followed by Immediate/ delayed ignition

On release of HSD from barrels, HSD will be spread on the ground and spread pool of HSD will be formed. On early or delayed ignition, spread pool fire will be observed. Consequence calculations for HSD from unloading hose followed by fire have been carried out as per the details given below:

- **Pool Fire Heat Radiation**

On ignition of spreading pool, thermal radiation distances will be as given:

Radiation Level	Thermal Radiation Level Distances (m)		
	4 m/s – B	3 m/s – D	3 m/s - E
37.5 kW/m^2	5.01731	4.77398	4.85939
12.5 kW/m^2	15.4784	14.5978	14.5136
4 kW/m^2	23.8895	23.3325	22.9963

Thermal radiation radii from spreading pool fire are shown in **Figure 7.1**.

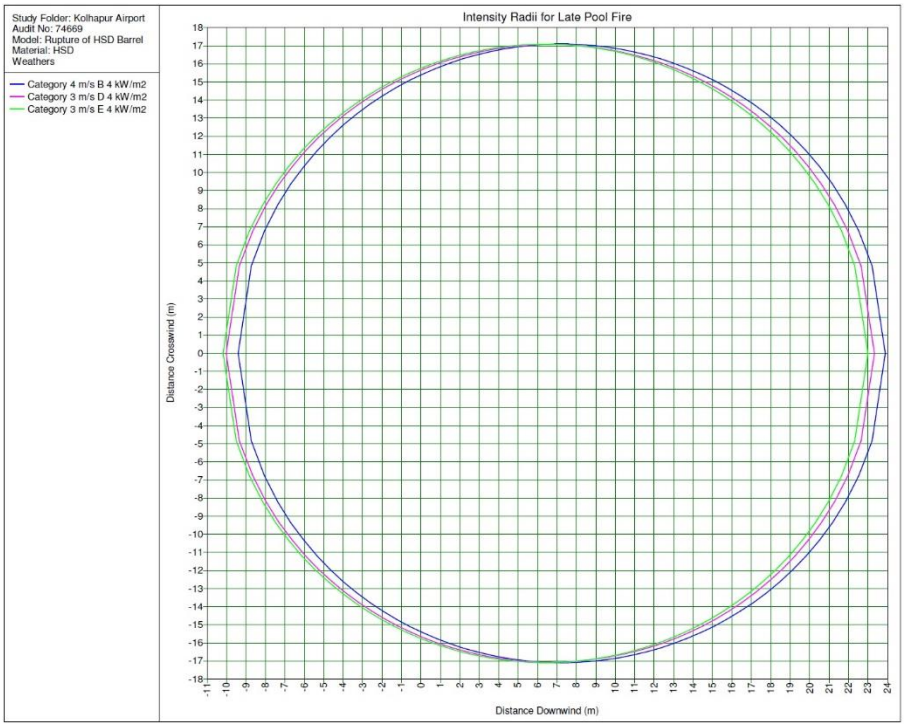


Figure 7.1: Intensity Radii for Late Pool Fire for Leakage of HSD from Barrels

Vapour Cloud Explosion: In the event of delayed ignition after release of HSD, vapours of HSD will be generated from the surface of spreading pool and dispersed into the atmosphere towards prevailing wind directions. However, no vapour cloud explosion will be occurred:

Scenario-2: Rupture of Hose filling of ATF in Aircraft followed by Immediate/delayed ignition

On release of ATF during filling aircraft, ATF will be spread on the ground and spread pool of ATF will be formed. On early or delayed ignition, spread pool fire will be observed. Consequence calculations for ATF from filling hose followed by fire have been carried out as per the details given below:

- **Pool Fire Heat Radiation**

On ignition of spreading pool, thermal radiation distances will be as given:

Radiation Level	**Thermal Radiation Level Distances (m)**		
	4 m/s – B	**3 m/s – D**	**3 m/s - E**
37.5 kW/m^2	Not Reached	Not Reached	Not Reached
12.5 kW/m^2	16.6201	15.8611	16.3586
4 kW/m^2	33.7282	32.9785	33.1916

Thermal radiation radii from spreading pool fire are shown in **Figure 7.2**.

Vapour Cloud Explosion: In the event of delayed ignition after release of ATF, vapours of ATF will be generated from the surface of spreading pool and dispersed into the atmosphere towards prevailing wind directions. However, no vapour cloud explosion will be occurred:

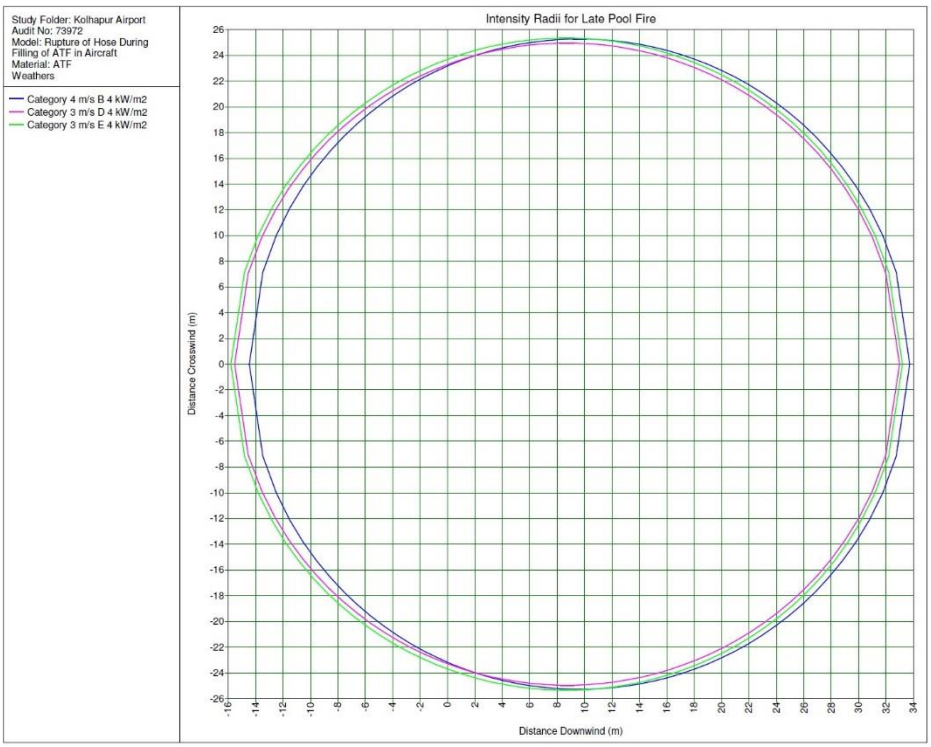


Figure 7.2: Intensity Radii for Late Pool Fire for Leakage of ATF from Loading Hose

Scenario - 3: ATF Tanker on Fire

In the event of ATF tank on fire, thermal radiation will be occurred in the surrounding area. Thermal radiation distances will be as given:

Radiation Level	**Thermal Radiation Level Distances (m)**		
	4 m/s – B	**3 m/s – D**	**3 m/s - E**
37.5 kW/m^2	Not Reached	Not Reached	Not Reached
12.5 kW/m^2	18.7714 7	18.4894	18.982
4 kW/m^2	45.473	44.2392	44.9804

Thermal radiation radii from tank on fire are shown in **Figure 7.3**.

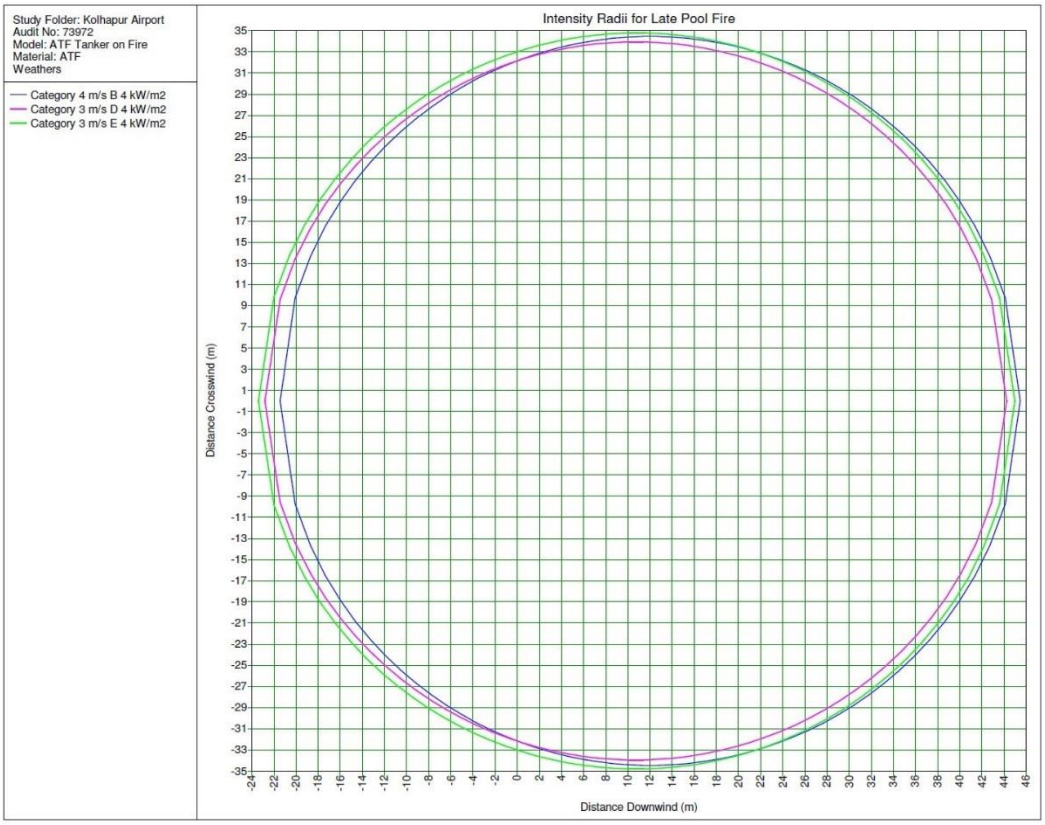


Figure 7.3: Intensity Radii for ATF Tanker on Fire

Explosion Effects: In the event of fire in ATF tanker, explosion may take place. Maximum distances for overpressure are as given below:

Concentrations	Distances (m)		
	4 m/s – B	3 m/s – D	3 m/s - E
Over Pressure	62.7668	82.3238	71.2583

7.1.11Risk Mitigation Measures

The risk mitigation measures will be taken at Kolhapur 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 have been 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 are carried out for storage area, hoses and fueling tanker and record will be maintained.
- Leakages from tanker is prevented by a suitable regime of preventive maintenance and inspection.
- Heat and smoke detectors will be provided at strategic locations.
- Adequate fire fighting facilities have been provided near storage and handling of HSD and ATF.
- Fire fighting facilities are tested as per schedule.
- Ground staff near aircraft has been trained to take measure in the event of spillage and during fire emergency.
- Fueling in Aircraft and DG sets 'day tank' is done under the supervision of trained operators.
- Every storage tank and tanker, including all metal connections, is electrically continuous and has been effectively earthed.
- Static grounding of aircraft is ensured whenever the aircraft is parked; including during refueling and defueling.
- Check list for operators for checking safety system and equipment is prepared and check records kept in safe custody.
- The critical operating steps are displayed on the board near the location where applicable.
- Standard Operating Procedure (SOP)" are followed while unloading or fueling the aircraft.
- Mock drills are conducted in every three months involving all concerned agencies.
- All concerned agencies are provided Disaster Management Plan and regular interaction are made.

Risk Mitigation Measures for Fueling of Aircrafts

- Earthing and bonding connections are attached and mechanically firm.
- Equipment performing aircraft servicing function is not positioned within 3 m radius of aircraft fuel vent openings.
- Equipment other than that performing aircraft servicing functions are not positioned within 15 m of aircraft during fuel servicing operations.

- The accessibility to the aircraft by fire vehicles are established during aircraft fuel servicing.
- Handheld intrinsically safe communication devices used within 3 m from the fuel vent is intrinsically safe.
- For open hose discharge capacity of the aircraft fueling system, at least one listed wheeled extinguisher having a rating of not less than 80-B.
- Presence of at least 2 x 9kg ABC dry powder fire extinguishers at both sides of the refueling browser / dispenser is ensured.
- Spark plugs & other exposed terminal connections are insulated.
- All vehicles, other than those performing fuel servicing, are not driven or parked under aircraft wings.
- Electric tools, drills or similar tools likely to produce sparks or arcs are not used.
- The ground service activities do not impede the egress should there be an emergency.
- A clear area for emergency evacuation of the aircraft is maintained at the rear (or front) aircraft exit door.

7.2 Disaster Management Plan

The important aspect in emergency management is to prevent by technical and organizational measures, the unintentional escape of hazardous materials out of the facility and minimize accidents and losses.

Emergency planning demonstrates the organization's commitment to the safety of employees and increases the organization's safety awareness. The format and contents of the Disaster Management Plan have been developed taking into consideration the regulatory guidelines, other applicable documents and accepted industry good practice principles formulated as a result of lessons learned in actual emergencies requiring extensive emergency response. A plan can work smoothly and effectively only if the instructions are correctly and promptly followed and action taken at various levels is well coordinated.

7.2.1 Objective of Emergency Planning

The objective of the disaster management plan is to describe the emergency response organization, the resources available and response actions applicable. It deals with various types of emergencies that could occur at Kolhapur Airport after proposed development with the response organization structure being deployed in the shortest time possible during an emergency. Thus, the objectives of emergency response plan can be summarized as:

- Rapid control and containment of the hazardous situation;
- Minimizing the risk and impact of an event/accident; and
- Effective rehabilitation of the affected persons, and prevention of damage to property.

To effectively achieve, the objectives of emergency planning, the critical elements that form the backbone of the plan are:

- Reliable and early detection of an emergency and careful planning;
- The command, co-ordination, and response organization structure along with efficient trained personnel;
- The availability of resources for handling emergencies;
- Appropriate emergency response actions;
- Effective notification and communication facilities;
- Regular review and updating of the plan; and
- Proper training of the personnel.

7.2.2 Categorization of Emergencies

The emergencies at the Kolhapur Airport after proposed development can be classified under several headings. These headings are listed below together with a description of the type of emergency.

i. Fires on the Ground

Fire on the ground can be aircraft related and non-aircraft related. Fire involving

aircraft can be at any location on the taxiway or apron area where the aircraft is parked. Non-aircraft related fire involves mainly the terminal buildings, ATF tanker and HSD storage, etc.

ii. Natural Disasters

Kolhapur airport is located in Seismic Zone III as per seismic classification. Seismicity is a natural hazard for Kolhapur Airport after proposed development. Therefore, necessary design measures have been taken for making structure earthquake proof.

7.2.3 Key Functions of Airport Director and Other Supporting Organizations/ Agencies/Services for mitigation of emergency at Kolhapur Airport after proposed development

Concerned officers and other external supporting organizations/ agencies/services will be called upon as necessary to mitigate crisis depending on the nature of emergency. Table below summarizes the general key functions of Airports Authority of India (AAI) and other supporting organizations/agencies/services during crisis at Kolhapur Airport after proposed development.

Sn	Organization//Agencies/ Services	Key Functions
1.	Kolhapur Airport Fire Service	• Fire-fighting operations • Post-accident fire protection • Evacuate injured passengers to hospitals • Support structural fire-fighting and evacuation • Support mitigation of dangerous foods accidents/incidents • Inform fire brigade at Kolhapur Airport
2.	Terminal Building Management	• Activate Key Officials and other external agencies/services such as hospitals, panel doctors, ambulance

Sn	Organization//Agencies/ Services	Key Functions
		services, • Activate the Emergency Response and Interaction Centre (ERIC) Group • Set up the Emergency Coordination Centre (ECC), Friends and Relatives Reception Centre (FRRC) • Passenger facilitation and business recovery at terminal buildings • Support terminal building evacuation
3.	Engineering	• Provide technical support and assistance • Support recovery efforts
4.	Local Police	• Guarding of site and preservation of evidence Kolhapur Airport including eye-witness accounts and photography. • Maintain law and order at the side.

7.2.4 Emergency Operations/Coordination Centers Established for Mitigation of Emergencies

During a major disaster such as severe fire outbreak at terminal building, the various emergency operations will be established immediately to mitigate the disaster.

The emergency operations and coordination centers at Kolhapur Airport will comprise Crisis Management Centre (CMC), Emergency Coordination Centre (ECC), and Friends and Relatives Reception Centre (FRRC). Each of them has its own functions and roles to perform during the crisis:

i. Crisis Management Centre (CMC)

Established by the AAI, the Crisis Management Centre is to function as an

overall overseeing and controlling authority of the crisis mitigating process during a major on ground fire. The committee of the Crisis Management Centre comprises the following permanent and supporting members:

The functions of the CMC include:

a. Formulate strategic plans and policies, as well as engage in high level decision making for the mitigation of crisis.
b. Control, coordinate and support operations during an Incident.
c. Oversee the work and progress of protracted fire-fighting and rescue, and salvage operations.
d. Liaise with the airline concerned, local authorities, ministries, and governmental departments for support.
e. Arrange and provide welfare to the staff involved in the mitigation of crisis.
f. Regulate the release of information to the public on the facts of the aircraft disaster.
g. Issue press releases and organize press conferences.
h. Ensure that the post-accident operations are completed expeditiously so that the Kolhapur Airport can resume normal operations in the shortest possible time.

ii. Emergency Coordination Centre (ECC)

Located near to Entry Gate, the Emergency Coordination Centre will be established by the Airport Director, during a major disaster, to coordinate the response and functions of the external supporting organizations, agencies, and services involved in the mitigation of the emergency.
The committee of ECC comprises the following officials:

- Terminal Manager - Chairman
- Engineering In-charge - Alternate Chairman
- Manager - Civil
- Manager - Electrical
- Security Officer
- CISF Representative
- Police Representative

Functions of the ECC include:

a. Support incident site fire-fighting and rescue operations through liaison and coordination with the external organizations/agencies/ services.
b. Facilitate mobilization of external resources to the crash site, such as issuing emergency passes and arranging with Apron Control for "Follow-me" vehicles.
c. Arrange and facilitate visits by the VVIPs to the site (if any).

iii. Assembly Area (AA)

Assembly area is an area set up near the incident site to temporarily receive the uninjured casualties until the arrangements to transport them to the Hospital is made. Two Assembly Areas (AA) will be near parking in front of terminal building.

iv. 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 accident. The documentation process within the FRRC helps to confirm who was on the site/aircraft and facilitates the reunion.

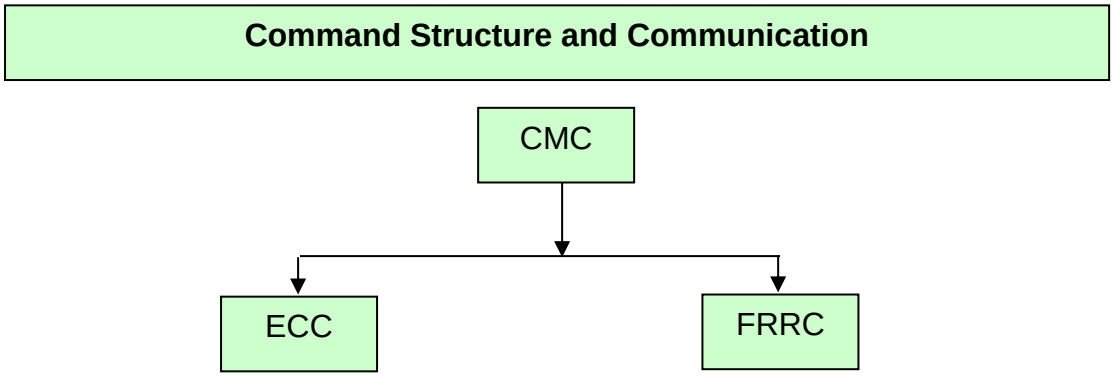
On receiving the "Fire" message, Terminal Director will set up the FRRC.

The 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 with the latest information including passenger manifest, that has been officially cleared;
- Provide care and comfort including refreshments;
- Arrange for doctors and/or CARE officers through ECC on a need basis.

Command structure and communication flow among various emergency / coordination centers is given below:



7.2.5 Media Management

Airport Director – Chairman and his team shall take the lead to handle all press matters. They are single point media interaction. They will be responsible for developing the overall information management plan, with emphasis on strategies to manage the information flow. They will also be responsible for the preparation of press releases and the organization of press conferences.

All press personnel will first be directed to Airport Director 's Media Centre. At the Media Centre, press briefing, communications and transportation service for taking the press personnel to and from the accident site, when permissible, will be arranged/provided.

No unauthorized persons shall be allowed in the Media Centre. Only members of the press, free-lance reporters and photographers wearing a valid pass issued by Airport Director will be admitted to the Media Centre, or transported to the scene of the accident.

7.2.6 Emergency Procedures

7.2.6.1Fires on the Ground (Aircraft Related Fires Occurring in Aircraft Movement Areas)

An aircraft can catch fire while it is taxiing in the movement area or parked. Such a scenario can arise from a defect or malicious act, and may develop into a major disaster.

When the aircraft on the ground on fire is sighted, Airport Fire Service through the crash alarm communication system will be informed and provide details of the aircraft fire, for example:

- Location of aircraft;
- Nature of fire (e.g. undercarriage fire, engine fire);
- Number of POB; and
- Presence of dangerous goods, if known.

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 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.

7.2.6.2Fires on the Ground (Fires Involving at Kolhapur Airport, *i.e.* Non-Aircraft Related Fires)

Fire may occur at any of the part of Kolhapur Airport. If out of control, such a fire may cripple the key Kolhapur Airport facilities and disrupt the normal operations.

During a fire occurrence, however small it may appear to be, any person discovering 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 Fire Service immediately of the exact location of the fire via the following telephone numbers.

  *Operate a suitable fire extinguisher where readily available, or any water hose reel within range. [*Note: Attempt to put out the fire using a fire extinguisher shall only be carried out if the fire is small (i.e., at incipient stage) and does not pose any danger to the operator. Also take note that water shall not be used on fire involving liquid such as HSD, as well as on energized electrical equipment unless such equipment has been de-energized.)*

- On receipt of a structural fire call, the Fire Operator shall request the caller to provide the following details:

  - Location of fire;
  - Type of fire;
  - Name of caller;
  - Telephone number of caller.

7.2.7 Training and Education

Regular training would be provided to all personnel who have a role in planning and operational response to an emergency. The main goal of training for emergencies is to enable the participants to understand their roles in the response organization, the tasks associated with each position and the procedures for maintaining effective communications with other response functions and individuals.

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.

7.2.8 Mock Drills and Exercises

Mock drills constitute another important component of emergency preparedness. They refer to the re-enactment, under the assumption of a mock scenario, of the implementation of response actions to be taken during an emergency. Emergency 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:

- The basic objectives,
- The dates, times and places,
- The participating organizations,
- The events to be simulated,
- An 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 would include comments from the participants and observers. Discrepancies noted by the drill observers during the drill shall be pointed out during the drill.

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.

The evaluation of a drill or exercise shall be submitted to the terminal manager for review and acceptance who shall then determine the corrective actions to be taken and assign the responsibility to appropriate personnel.

The Safety In-charge would track all approved drill and exercise corrective actions as a means of assuring that corrections are made in a reasonable amount of time, and shall advise the Terminal Manager of the status of implementation of corrective actions.

Records of drills, exercises, evaluations, and corrective actions would be duly maintained.

7.2.9 Updating of Emergency Plan

The Kolhapur Airport's emergency 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.

7.3 Social Impact Assessment and R&R Action Plan

Kolhapur Airport is located on 750.56 Acres land. For straightening boundary Kolhapur Airport 1.90 Acres land will be acquire by the state government and handed over to AAI. Additional 64 Acres land will be required for extension of runway. AAI has requested State Government for handover 27.01 Acres forest land, after diversion of forest land for none forestry use for construction of new ATC Tower. No and displacement of person is involved in the project. Therefore, Social Impact Assessment and R&R Action plan is not required as there is no project affected person because of no land acquisition. The anticipated impacts on socio- economic environment due the proposed development of Kolhapur Airport have been identified and assessed in Chapter 4 of the EIA report.