

7. Additional Studies

7.1 Disaster Management Plan

A disaster is an event triggered by natural or man-made causes that lead to sudden disturbance of normalcy of life, causing widespread damage to life and property. Disturbance can be caused due to occurrence of frequent hazards like earthquakes, fires, cyclones, terrorism, and chemical explosions. Level of risk majorly depends upon the various hazards for which any specific area is prone to also on the various physical, social-economic and institutional parameters. This chapter will cover an outline of disaster management plan to handle emergency situations as identified for ECC and their respective emergency response.

7.1.1 Identified Emergency Situations

Broadly, the emergency situations identified for the premises of ECC can be classified as:

- **Natural Hazard-** These are often sudden and intense resulting into considerable destruction, injuries and deaths. Population is the key factor in ECC; which is likely to perceive major impact because of magnitude and frequency of the hazard.
 - Floods
 - Earthquake
- **Man-Made Hazard -** These are anthropogenic in nature, can be sudden or progressive, which impacts with such severity that the affected community has to respond by taking immediate and exceptional measures including help from outside the community.
 - Fire and Explosion
 - Structural Collapse
 - Electrocution
 - Bomb Threat
 - Road Accidents and transportation of hazardous material, if any

As per the seismic zoning map of India (IS: 1893, Part-1, 2002), the project site is located in the Zone IV, classified as MSK VIII i.e., area having high damage risk zone. The design of all the proposed facilities in the project will take into account the required seismic resistance.

The proposed project envisages storage of diesel and lube oil for generator and liquefied petroleum gas (LPG) for hotels/ restaurants.

Emergency prevention through good design, operation, maintenance and inspection are essential to reduce the probability of occurrence and consequential effect of such eventualities. However, it is not possible to totally eliminate such eventualities and random failures of equipment or human errors, omissions and unsafe acts cannot be ruled out. An essential part of major hazard control has therefore, to be concerned with mitigating the effects of such emergency and restoration to normalcy at the earliest.

The overall objective of a disaster management plan is to make use of the combined resources at the site and outside services to achieve the following:

1. To localize the emergency and if possible eliminate it;
2. To minimize the effects of the accident on people and property;
3. Effect the rescue and medical treatment of casualties;
4. Safeguard other people;
5. Evacuate people to safe areas;
6. Informing and collaborating with statutory authorities;
7. Provide authoritative information to news media;

8. Initially contain and ultimately bring the incident under control;
9. Preserve relevant records and equipment for the subsequent enquiry into the cause and
10. circumstances of the emergency; and
11. Investigating and taking steps to prevent reoccurrence

The DMP has therefore, to be related to the identification of sources from which hazards can arise in the concerned area. The plan takes into account actions that can successfully mitigate the effects of losses/ emergency need to be well planned so as they would require less effort and resources to control and terminate emergencies, should the same occur.

In the sections below, the identification of various hazards is addressed qualitatively, which gives a broad identification of risks involved in the ECC operation. Based on the risk assessment of various hazards, disaster management plan has been formulated and presented here.

7.1.2 Storage of Hazardous Material

The proposed project envisages **storage of diesel and lubes oil for diesel generator sets and liquefied petroleum gas (LPG)** to be used in pantry/ kitchen areas of hotels/ restaurants and other areas.

It is to be noted here that the above material will not be stored in the bulk quantities. The lube oil will be stored in drum and the LPG will be obtained in cylinders supplied by the local dealer. ECC will have HSD storage area of 80.0 X 13.5 m for storage of 1.5 day demand.

7.1.3 Preliminary Hazard Analysis

A preliminary hazard analysis is carried out to identify the major hazards associated with the operations / activities performed within ECC.

Table 7-1 Preliminary Hazard Analysis

Equipment/ Activity	Process	Potential Hazard	Provision
Use of Machinery	Excavation / Levelling of surfaces.	Accidents	All precautions written in the Safety Manuals of the respective machineries will be followed
Vehicular Movement	Transporting construction material.	Accidents	Construction will occur in phases. An appropriate Transport Plan will be followed which will also involve plying of vehicles on selective routes only.
Noise	Transportation, operation of DG sets	Permanent or Temporary hearing impairment.	EMP for Noise
Dust and Fumes	Shifting materials, Cutting, Transport activities	Dust induced respiratory diseases, eye irritation etc.	EMP for Air
Working at height	-	Falls which may result in fatal injuries	Safe systems of work will be provided as discussed in DMP (On-site). This will include design safety and provision of PPEs
DG	Operation	Mechanical hazards and fire hazards in 1. Lube oil system 2. Cable galleries 3. Short circuits	All electrical fittings and cables are provided as per the specified standards. Fire Detection Alarm System
Power Transformer	-	Fire and Explosion	All electrical fittings and cables are provided as per the specified standards. Fire Detection Alarm System
HSD and Lube oil Storage	Storage and supply of fuel to DG sets.	Fire and explosion	Separate storage area for the drums. Fire hydrant system for

			DG re-fueling. Fire Detection Alarm system and Fire extinguishers
LPG Cylinders storage	Used in Hotel Kitchen	Fire and explosion due to Leakage	Separate storage area for the cylinders with Fire extinguishers
LPG pipeline	Supply line	Fire and explosion due to Leakage	Fire Detection Alarm System will be provided Safe systems of work in the proximity of the pipeline
LPG pipeline	Supply line	Leakage without fire	Provision of water sprays Safe systems of work in the proximity of the pipeline
Natural Calamities like earthquake		Total Collapse of the building	Building Design as per the Seismic Zone Designs

Table 7-2 Preliminary Hazard Analysis in General

PHA Category	Description of Plausible Hazard	Provisions
Environmental Factors	If there is any leakage and eventuality of source of ignition.	All electrical fittings and cables will be provided as per the specified standards. All motor starters and switches will be flame proof.
	Highly inflammable nature of the chemicals may cause fire hazard in the facility.	Fire extinguisher of small size and big size will be provided at all potential fire hazard places. In addition to the above, fire hydrant network as per TAC guidelines will also be provided. Fire Detection Alarm System will be provided

7.1.3.1 Preparedness for the Emergency

The goal of preparedness for any emergency is to achieve a satisfactory level of readiness to respond to any disaster in order to save lives, minimize disaster damage, and enhance disaster response operations. The basic approach towards emergency preparedness will comprise of the following activities:

- Identify all risk associated with each building type in size of facilities at ECC, so as to anticipate the actions to be taken should an emergency response be required.
- Establish an Auxiliary Management Team (AMT) to implement Emergency Procedures at each building;
- Develop a work plan with details regarding the course of action to be followed in order to minimize personal injury and property damage in the event of fire, flood, loss of ground, or natural disaster.
- Train the personnel in planning and responding to an emergency;
- Prepare a facility-wide, list of names and telephone numbers which will be available at each building in the premises of ECC. . The list will include details of all management, trained emergency responders, and Fire and Police Departments.
- Test the arrangements and procedures in practice, as often as appropriate;
- A local fire station within the ECC campus has been planned to be developed, with two (2) Fire Tenders stationed at all times. A dedicated road of width 9m and a turning radius of 12 m has been planned for movement of fire tenders in times of any emergency.

7.1.3.2 Roles and Responsibilities

The details given in the subsections identify the interlinkage and synchronization among the following:

- Site Main controller for each ECC
- Auxiliary Team controller in each building of ECC with designated officers for the emergency management will be called Auxiliary Management Team (AMT);
- External agencies for local support

The primary roles of **Site Main controller** are to:-

- Respond to the on-site response plan in case of any emergency pertaining to the site;
- Utilize site and local resources;
- Set up Emergency Control Centre to direct emergency operations.
- Assess the magnitude of the situation and decide if evacuation is required from the affected areas;
- Direct the safe shutting down of the installations in consultation with ATC and other important officers, if necessary.
- Liaison with District Magistrate, Police, Fire Brigade and other agencies, if necessary in coordination with communication/ liaison officer.
- Communicate all the things to Auxiliary Management Team via Auxiliary Team Controller till the affected area is cleared.
- Declare the "All Clear Situation" after the emergency is cover.

Auxiliary Management Team (AMT)

AMT at the operating site under its control will have following role:

- Control the emergency and render the building or premises safe by the application of local resources; and
- Support the local response effort by co-ordinating additional equipment, personnel, and other external resources.

The auxiliary Management Team will comprise of:

Auxiliary Team Controller- who will supervise the following officers, forming as a team.

- Fire/ Safety Officer;
- Evacuation Officer;
- Communication/Liaison Officer and;
- Medical Officer.

The primary roles of **Auxiliary Team controller** are to:-

- Coordinate with Site Main Controller to address the emergency with the help of Auxiliary Management Team.
- Provide advice on possible effect on areas and outside the premises to the local & district administration about the incident and probable need for evacuation;
- Direct all the operations within the affected areas with priorities for safety personnel minimize damage to the property and environment;
- Ensure that the non-essential staff, workers of the areas affected are evacuated to the gathering areas and the area is searched for casualties;
- Direct the supervisor of the affected areas for the safe guarding of the personnel,
- minimize the damage to site and environment;

The role of the members of Team is a detailed below:

Fire/ Safety Officer

- Reports to Auxiliary Team Controller and assist him in all matters;
- Consult site supervisor of the area regarding special precautions such as type of material involved in fire;
- Arrange first aid to the casualties and other emergency equipment;
- In post- accident condition to gather information on the material /equipment involved in the accident and its danger potential, its effect on humans and environment;
- Assist site controller in maintaining the emergency equipment; and
- Assist the site controller in conducting / evaluating mock drills.
- All the fire fighters shall work under his guidance at the time of emergency.

Evacuation Officer

- Proceed to emergency area and report to Auxiliary Team Controller and acts as per the instructions;
- Consult the affected area site supervisor for evacuation of the employees;
- Advice all the employees expect auxiliary management team to assemble at gathering area;
- If required nearby employees also to be evacuated;

- To perform head count at gathering area and shall record names;
- Compare the names with the attendance list if any missing inform to Auxiliary Team Controller.
- Proceed to the emergency area and report to the Auxiliary Team Controller after getting the information regarding emergency through telephone or through messengers; He will reserve specified messengers to act as runners between the auxiliary main controller and himself;
- He handles all the transmission to the emergency control centre and dispatched from it, including those to outside agencies and technical information source;
- As per the auxiliary main controller's instructions, he will pass information to other members, if required.

Communication/Liaison Officer

- As soon as he receives the information he should proceed to the emergency control centre and report to the auxiliary main controller;
- He has to co-ordinate with all the outside agencies who offer assistance to an emergency response supporting team;
- He shall know who represents the various agencies and where and how to contact them;
- Some of the agencies liaised with are the law, enforcements, public fire services, red cross, rescue and emergency services, local government officials (Police), utility personnel (telephone, electrical, water), health officials, hospitals and ambulance services, lawyer for legal advice (if necessary).
- He is to ensure that casualties received adequate attention and the alternate transport, when in need;
- When emergency is prolonged he shall co-ordinate with supply officer to arrange for the relief of rescue or fire fighting personnel and organize refreshments or catering facilities;
- He is responsible for evacuation of the nearby village people, if situation warrants.

Medical Officer:

- On receipt of information keep him ready and alert his staff to attend serious and urgent cases;
- The medical officer is responsible for providing first aid to those injured/ rescued and making that they are promptly transported for further treatment if required;
- Co-ordinate the supply officer for medical supplies;
- He should familiar with antidotes for specified materials.

7.1.4 Emergency Equipment

The Site Main Controller will maintain a list of emergency handling equipment including details of fire extinguishers, protective clothing, and personal protective equipment for emergency handlers etc. In addition to these, details of available fire management services and hospitals will be available with main incident controller in his operating checklist.

7.1.5 Specific Emergency Response Procedures

Actions are mainly procedures which are to be performed during or immediately after a disaster to minimize suffering and losses through emergency communication, medical assistance, evacuation and search and rescue. Procedures for such events are required and must be understood by all staff, which to be detailed out at later stage. .

Procedure: Fire

A fire is the unplanned and undesired combustion of materials that poses a threat to employees, visitors and property. The purpose should be to reduce the possibility of a fire in the practice, as well as specify the equipment and policies that are to be used in case of a fire. The designated fire officer makes it mandatory to ensure that every employee is taught how to use a fire extinguisher. Fire extinguishers are to be located at conspicuous locations with basic instructions.

Procedure is as follows:

- On hearing the alarm designated fire officer shall immediately contact the Control Room extension to confirm the location and extent of the fire.
- To inform Auxiliary Team Controller;
- Proceed to the location of the fire and take charge of the operation.
- Depending on the extent of the fire or its potential for spreading, he shall utilize the resources at his command to contain or extinguish the fire until the fire brigade arrives.

- All Staff with no designated fire duties shall see that their work area is left safe and report immediately to the nearest assembly point.
- Account for all staff on record.
- Inform the security personnel at the gate to expect the fire brigade and to direct them by the chosen route.

Procedure: Leakage from LPG Cylinder without Fire

- Cordon off the area around 30 meters radius so that no vehicle or source of ignition approached the area. Attempt to close the control/ manual valve.
- Open all windows to increase ventilation and hence prevent build-up of vapour cloud.
- Avoid getting entrapped in the cloud vapour.
- Water sprays should be used to disperse the vapour cloud.
- Warn the surrounding areas to put off all naked flames.

Procedure: Earthquake

An earthquake is a sudden shaking of the earth caused by the breaking of rock beneath the earth's surface and followed by a series of vibrations. Earthquakes can cause buildings and bridges to collapse, telephone and powerlines to fall.

Procedure is as follows:

All persons shall protect themselves as best as possible during an earthquake by finding the nearest safe location, such as:

- Beneath a sturdy desk
- Between a door structure
- In a wide open area
- Outside and away from the building
- All persons must leave the building after the shaking stops.

Procedure: Bomb Threat

Actions taken in response to such a threat should be prompt and assure the safety of employees, and visitors to the each building of ECC. While a bomb threat may be a hoax, all such threats should be treated seriously.

Procedure is as follows:

- Do not touch anything electrical including turning lights on or off.
- Do not take a phone off the hook or replace it.
- Do not use radios or cellular telephones.
- Do not move anything that looks out of place,

If a suspected bomb device is found, take note of the location, but do not touch it. Notify the police regarding the whereabouts of any suspected bomb device. Once it is determined that a bomb threat has been made, the Site Main Controller will coordinate evacuation of the facility by telling visitors and employees that there is a gas leak or similar condition that requires immediate evacuation.

Precautions to be taken in case of proximity to the LPG pipeline

Concerned people should be aware of the following:

- Potential dangers associated with fire and explosion
- Potential toxic effects of the products of combustion
- Other potential dangers of gas leaks, such as asphyxiation

Precautionary measures that can be taken are:

- Adequate ventilation in the vicinity
- Safe systems of work in the proximity of the pipeline (surroundings should be kept free of flammable sources and combustible materials)
- Adequate fire-fighting provision

- Provision of dry powder type extinguishers
- Appropriate training and instruction for all concerned
- Appropriate signage showing hazards associated with LPG
- Emergency procedure notices
- Avoid having any open drains nearby

Action Plan for Diesel Emergency

- A fire at a small leak in pipeline must be attacked promptly with nearest available fire extinguisher before it has a chance to spread and get out of control. Call for help from all the available employees at the same time.
- Work to keep the fire from spreading.
- Shut off flow of oil in line by closing valves and by stopping pumping.
- Cover the oil pool by sand and build up the pile of sand so as to cover the leak.
- Put foam on the burning oil pool. Apply the foam gently so as not to scatter the burning oil.
- Do not leave oil trapped in short lengths of pipe exposed to fire between the closed valves, since, oil so trapped and heated often bursts the pipe and spills out spreading the fire.
- Wet down adjacent structures to keep them cool.

7.1.6 Post Emergency Follow up

- All cases of fire occurrence, no matter how small, must be reported promptly for follow up.
- Under no circumstances should fire extinguishing equipment once used be returned to its fixed location before it is recharged/ certified fit by the Fire chief/ Safety Manager.
- Used fire extinguishers must be laid horizontally to indicate that they have been expended.

7.1.7 Emergency Control Centre

The main administrative office will be nominated as the Emergency Control Centre. At the time of the emergency Main Site Controller assisted by other designated coordinators shall take position to perform their duties. The security office at the gate shall be the standby. The Emergency Control Centre will be the focal point in case of an emergency from where the overall operations to handle the emergency are directed and coordinated. It will be located outside the area of potential hazards and easily approachable.

The Emergency Control Centre should have the following resources available:

1. Copies of the DMP
2. Master Layout Plan of the Exhibition cum Convention Centre
3. Information regarding Safety Equipment, Fire Fighting material
4. A list of telephones of key and essential staff along with their residential numbers.
5. Copies of the local Telephone Directories.
6. A list of important telephone numbers like neighbouring premises / industries, Fire Brigade, Hospitals.
7. Personal Protective Equipment.
8. First – Aid Kit.
9. Communication equipment – Internal and external telephones and other communication equipment.
10. Requisite stationary items.
11. Personnel to act as messengers.

The communication equipment is checked periodically to ensure that they are functional. The Emergency Control Centre should be capable of being activated within a few minutes upon declaration of an emergency.

7.1.8 Response Evaluation, Testing and Updating of the Plan

Formulation of a Disaster Management Plan cannot possibly be an end by itself. It needs to be tested by holding of periodical mock emergency simulation and drill. Any shortcomings revealed during such exercise should thereafter be corrected by amending the plan. The plan should be for times to come; hence it must be reviewed at periodic intervals. The plan should be also reviewed and updated when:

- Major alteration or extension of existing facilities is carried out.
- Major change in habitation or land use of the neighbourhood takes place.
- Important telephone numbers used are altered.

Mock drills activating the Disaster Preparedness Plan should be conducted periodically for ensuring its efficiency during emergency as well as for refinement and updation. These drills based on the plan will help achieve its objectives of the disaster management plan.