

7. ADDITIONAL STUDIES

7.1 INTRODUCTION

M/s Supertech Limited, the promoter of the proposed project is committed to formulate a Disaster Management Plan keeping in view two primary goals:

- To reduce the likelihood that the proposed project will experience disaster and
- To mitigate the impact of any disasters that may occur due to fire, explosion, sudden leakage of gas etc.

Disaster or emergency can be defined as any condition, man-made or natural, which results in a significant disruption to human life and materials. The on-set of most disasters is considered to be very rapid, allowing a minimum of time for preparation. The scale of a “disaster” is determined by the loss of life, damage to facilities, and the amount of external resources for the place of occurrence to return to its normal activities. 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 is therefore concerned with mitigating the effects of such emergency and restoration of normalcy at the earliest. To overcome such eventualities, an emergency response plan and an emergency response team is required to be formulated.

7.2 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

The overall objective of DMP is to make use of the combined resources at the site and outside services to achieve the following:

- To localize the emergency and if possible eliminate it;
- To minimize the effects of the accident on people and property;
- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Evacuate people to safe areas;
- Informing and collaborating with statutory authorities;
- Initially contain and ultimately bring the incident under control;
- Preserve relevant records and equipment for the subsequent enquiry into the cause and circumstances of the emergency;
- Investigating and taking steps to prevent reoccurrence

The DMP is, therefore, related to identification of sources from which hazards can arise (based on Hazard Identification) and to minimize credible loss scenario that can take place in the

concerned area. The DMP takes into account the maximum credible loss scenario and actions that can successfully mitigate the effects of losses.

Hence emergency plan need to be well planned, so that with less effort and resources, emergencies may be controlled and terminated, in minimum time, to reduce damages to life and properties. The Disaster Management Plan is designed to-

- Anticipate the types of disasters that are most likely to occur.
- Identify the possible effects of any disaster that may occur.
- Identify the preventative and mitigating strategies to deal with any possible disaster.
- Involve all role players in a coordinated manner to respond to the challenges posed in disaster situations.
- Procure essential goods and services for disaster management.
- Identify the weaknesses in respect of capacity and skills to deal effectively with disastrous situations.
- Provide essential training and skills to handle such disaster and to promote awareness and preparedness in respect of the occurrence of disasters.
- Plan in advance the relief and rescue operations that may be required or to be exercised in disaster situations.

The hazard identified for the project includes hazards pertaining to fires in buildings and fire in diesel storage areas, LPG leakage and earthquake. DMP pertaining to these as described in the following sections.

7.3 FIRE FIGHTING SYSTEM

A state of the art fire fighting system is proposed for the project to prevent and control fire outbreaks. The firefighting system will consist of portable fire extinguishers, hose reel, wet riser, yard hydrant, automatic sprinkler system, and manual fire alarm system. The proposed buildings will also be provided with automatic fire detection and alarm system. ***The Firefighting network followed by Emergency Response and mock drills are essential part of Risk Control Measures.***

The project site falls under residential landuse according to Noida Master Plan 2021. Provisions will be made according to National Building Code 2005. The firefighting system has been designed considering the following codes, manual and guidelines;

- National Building Code of India (NBC);
- Latest relevant NFPA codes, USA, in particular NFPA – 13, 14, 20 & 22;
- IRI guidelines;
- As per requirement of fire officer/local fire approving authorities; and
- As per Indian Standard Code for Fire Protection (IS Codes)

Following items are envisaged for firefighting:

- Automatic sprinklers will be installed in the entire building

- Provision of hose reels, external hydrants and wet risers
- Four water storage tanks, along the site boundary, are provided at the ground level for the firefighting, with a total capacity of 602 KLD.
- Fire-Water Connections and firewater inlet and outlet connections shall be provided to the water storage tanks;
- There is a provision of firefighting pumps; Pumps shall be protected with Sprinkler as per NFPA 20 (refer to NFPA 13 for design); All pumps and accessories and electrical controllers shall be as per UL/FM lists, tested, approved and certified; and
- Adequate Fire Extinguishers shall be available for emergency situations, and portable fire extinguishers shall be provided at strategic locations; The fire extinguishers provided shall be in conformance with Ozone Depleting Substances (Regulation and Control) Rules 2000.
- Automatic fire detection system i.e. smoke/ heat detection system shall be provided in the buildings at appropriate places. The system will be connected to the fire alarm system
- External main fire ring, having 150 mm diameter and hydrants @ 45 m³/s spacing shall be provided. This external fire ring shall be separated from the Sprinkler Main Systems;
- By-pass arrangements shall to be provided (150 mm diameter nominal bore) with NRV and gate valve and bulk flow meter on the discharge header of each pump to check the duties of pumps.
- DG sets need to be protected with mist as per the applicable regulation (refer to NFPA 750 for design)

HSD and other petroleum products at site shall be stored at earmarked area having impervious floor and adequate firefighting arrangements. Hazardous wastes as waste oil shall be collected and stored and periodically sold off to MoEF& CC/ SPCB authorized recyclers. Buy back arrangement shall be made with the authorized dealer of Lead acid storage batteries used in the D G Sets.

There are two fire stations within 5km of the project site, one at Sector 15 NOIDA, south of the site and one at Sector 58 NOIDA north-west of the site.

7.3.1 Response for LPG Leakage

- The affected area should be evacuated and cordoned off immediately.
- Initiate an Emergency Response Team for LPG leakage.
- Shut down the main valves in the gas bank.
- Ensure that only concerned personnel are present in the affected area and all other personnel and visitors are moved to the nearest assembly points.

- Rescue trapped personnel, also check if any personnel are unconscious in the area and immediately move them outside and provide first aid.
- Ambulance should be summoned to take injured personnel to the nearest hospital.
- Personnel in the nearby buildings to close all doors and windows to prevent entry of the leaked gas.
- Source of leakage to be traced and isolated from all the other areas. If required use pedestal fans to bring down the gas concentration.
- In case of a fire follow the instructions.

7.3.2 Response in case of Fire

- Required response during in the event of a fire shall be described in signs located in the lobby.
- On sighting a fire, it shall be immediately informed to the environment manager giving the exact location and type of fire in detail.
- Initiate the Emergency Response Team for fires
- If the fire is small, engage in extinguishing the fire using the nearest fire extinguisher.
- Guide the Emergency Response Team staff to the emergency assembly point.
- The Emergency Response Team shall immediately inform the nearest dispensary and security force. If required a fire tender shall be summoned.
- The response team shall immediately move to the point of fire and take all necessary steps to stop the fire. If the fire is not controllable and spreads then the manager in charge shall inform the district authorities and call the nearest fire station.
- The Emergency Response Team will provide immediate relief to the injured residents at the scene of incident. Any injured persons shall be evacuated on priority to the dispensary or one of the hospitals based on their condition.

Instructions for occupants

- Get out of buildings as quickly and as safely as possible.
- Use the stairs to escape. When evacuating, stay low to the ground.
- If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
- Close doors in each room after escaping to delay the spread of the fire.
- If in a room with a closed door.



Figure 7-1: instruction in case of fire, Source- <http://s3.amazonaws.com/bou-sa/evacuation-instructions-in-case-of-fire.html>

- If smoke is pouring in around the bottom of the door or if it feels hot, keep the door closed.
- Open a window to escape or for fresh air while awaiting rescue.
- If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
- If there is too much smoke or fire in the hall, slam the door shut.
- Stay out of damaged buildings.
- Check that all wiring and utilities are safe.

7.4 EARTHQUAKE SAFE STRUCTURE

The project area is in Seismic Zone–IV and hence care has been taken in design so that it can withstand the earthquake of with maximum magnitude and intensity likely to occur in zone IV. The IS code assigns zone factor of 0.24 for Zone IV.

There will be adoption and implementation of New Technologies in Earthquake Resistant Design of buildings (as per the Uttar Pradesh State Disaster Management Plan for Earthquake, 2010). The buildings have been constructed as per earthquake resistance provisions of the state, which include the following¹, since the project site falls under earth quake high damage zone (risk zone IV):

- IS 1893 (Part 1): 2002 ‘Criteria for Earthquake Resistant Design of Structures’
- IS 4326:1993 ‘Earthquake Resistant Design and Construction of Buildings – Code of Practice’
- IS 13920: 1993 ‘Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces-Code of Practice’

However following response procedures has been prepared to deal with occurrence.

7.4.1 Response Procedures for Occupants for Earthquake

7.4.1.1 If Indoors

Occupants will be informed and instructed following practices if they are indoor-

- To stay inside **DO NOT run** outside or to other rooms during shaking.
- **DROP down** onto your hands and knees before the earthquake knocks you down. This position protects you from falling but allows you to still move if necessary.
- **COVER your head and neck** (and your entire body if possible) under the shelter of a sturdy table or desk. If there is no shelter nearby, get down near an interior wall or next to low-lying furniture that won't fall on you, and cover your head and neck with your arms and hands.

¹ Source: Uttar Pradesh State Disaster Management Plan for Earthquake 2010;
http://rahat.up.nic.in/sdmplan/Earthquake/Earthquake_Plan05March4pm.2010.pdf

- **HOLD ON** to your shelter (or to your head and neck) until the shaking stops. Be prepared to move with your shelter if the shaking shifts it around.



Figure 7-2: Practices for indoor safety during earthquake, source-<http://emergency.cdc.gov/disasters/earthquakes/during.asp>

- **DO NOT stand in a doorway.** You are safer under a table. In modern houses, doorways are no stronger than any other part of the house. The doorway does not protect you from the most likely source of injury—falling or flying objects. Most earthquake-related injuries and deaths are caused by falling or flying objects (e.g., TVs, lamps, glass, bookcases), or by being knocked to the ground.
- If possible within the few seconds before shaking intensifies, quickly move away from glass and hanging objects, and bookcases, china cabinets, or other large furniture that could fall. Watch for falling objects, such as bricks from fireplaces and chimneys, light fixtures, wall hangings, high shelves, and cabinets with doors that could swing open.
- If available nearby, grab something to shield your head and face from falling debris and broken glass.
- If you are in the kitchen, quickly turn off the stove and take cover at the first sign of shaking.
- If you are in bed, hold on and stay there, protecting your head with a pillow. You are less likely to be injured staying where you are. Broken glass on the floor has caused injury to those who have rolled to the floor or tried to get to doorways.

7.4.1.2 If outdoors

Occupants will be informed and instructed following practices if they are Outdoor-

- To stay outside, and stay away from buildings utility wires, sinkholes, and fuel and gas lines.
- If you cannot get clear of hazards, getting back inside a building is better than staying on the sidewalk.
- In a car, ease off the accelerator and slow down carefully. Move to a clear area away from buildings, trees, overpasses, or utility wires. Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

7.4.1.3 After the quake

- After the quake be prepared for aftershocks
- Avoid using vehicles except in emergencies.
- Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.
- If the electricity is off, turn on a flashlight.
- Once you are sure that you're all right, check the people around you for injuries.
- Check yourself for injuries and protect yourself by putting on shoes, work gloves and any other protective gear at hand.

7.4.1.4 Help injured or trapped persons

- Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
- Remember to help those who may require special assistance--infants, the elderly, and people with disabilities.
- Stay out of damaged buildings.
- Use the telephone only for emergency calls