

Disaster and Emergency Response Management

An emergency is defined as a situation or an impending situation caused by the forces of nature, an accident, an intentional act or otherwise that constitutes a danger of major proportions to life or property.

Disaster, in this context, means a sudden, accidental event that causes many deaths and injuries. Most disasters also result in significant property damage. Common natural causes of disasters include earthquakes, floods, hurricanes and typhoons, and tornadoes. Tsunamis (popularly, but incorrectly, known as tidal waves), volcanic eruptions, wildfires, and landslides and avalanches rank among the other natural forces that sometimes create disasters.

Major hazards can be generally associated with the potential of fire, flood, or earthquake or human activities of terrorism and disruption. Hazard control system is meant to ensure the avoidance of the hazards, or in case of any mis-happening with minimum possible impact on facility occupants, surrounding residents and surrounding environment.

Most of the situations are likely to be in the category of *Level 1 Emergency* (a local incident with a likely impact only to immediate surroundings of local site, where the impact radius may not be more than 15 m, such as, local fire, etc.) or *Level 3 Emergency* (an incident with likely impact area extending beyond the boundary limits of the project area, such as, floods, earthquakes, etc.).

On site emergency management will meet the exigency created due to all Level 1 emergencies. Level 3 emergencies need off-site management plan.

Disaster, in this situation, may include incidences of;

- 1. Flood – No long flow surface water body (having high command/watershed area) within 15 km carrying regular or seasonal water. There are no reported instances of flooding and around the area in last 50 years.**
- 2. Earthquake – The area is located in Zone-IV (High damage risk zone) seismic classification. All structures have been designed keeping in view the recommended design and safety practices. Due diligence will be adopted while implementing the design during construction.**
- 3. Fire – The construction and material specifications adopted by the promoters lay specific emphasis fire-retarding and fire safety properties. Adequate, fire fighting arrangement at micro level has been planned by the promoter. In case of any mishap, suitable provisions for emergency evacuation has been incorporated. There is no fire sensitive establishment within or vicinity of the complex.**
- 4. Disruptive incidents of human extremism – The complex, during inhabitation, has been planned to have controlled entry of authorized/identified persons. Appropriate safety and guard system will be adopted.**

To contain the retrospective effects, only government authorities and agencies, at local and state level got to be adequately prepared in its mechanism to contain or minimize the losses arising thereof.

1.0 General guidelines

Construction phase

1. Adequate provision of personal protective equipment for all the site workers
2. At least one dedicated vehicle at site to evacuate affected persons during any mishap
3. Adequate first-aid facility at site
4. Responsibility of the Project Manager to ensure that the safety procedures and practices are sufficiently followed
5. Adequate training to the workers and supervisors on emergency response with periodic mock drills
6. Material, vehicle and manpower movement routes to be clearly identified and marked
7. Contact details of persons to be contacted during emergency (from management, district administration, police, hospital/health, fire department, state electricity supply, etc.) to be prominently displayed at various locations
8. Commitment of sufficient budgetary provision

Operation phase

1. A safety committee (represented by the project management and inhabitants) to be constituted for overall management of safety and emergency response
2. Planning, design and implementation sufficient measures (for fire safety, electrical safety, etc.) conforming to NBC recommendations and local bye-laws
3. Dedicated first-aid room with adequately provided supplies
4. Mechanism for quick shut-down of electricity supply
5. Adequate training to the inhabitants and management committee on emergency response with periodic mock drills
6. Regulated and recorded entry of outsiders/visitors
7. Routes for emergency evacuation and movement to be clearly marked and plans displayed at appropriate locations
8. Assembly area(s) during emergency to be clearly marked and plans displayed at appropriate locations
9. Contact details of persons to be contacted during emergency (from management, district administration, police, hospital/health, fire department, state electricity supply, etc.) to be prominently displayed at various locations
10. Periodic third-party audit of safety of the complex
11. Commitment of sufficient budgetary provision

2.0 Training and Information

While technical measures are essential for the safety, the role of people in management of disasters can not be ignored. The people can have a negative as well as a positive influence on the safety.

It is important to train not only the persons directly involved by the virtue of official authority

or institutional affiliations (including NGOs), but also the general public by appropriately disseminating information on;

1. Possible disaster prone situations and extent of impact
2. Experience in similar situations elsewhere
3. Expected response and measures
4. Role of various constitutional authorities

3.0 Off-site Emergency Management

The Off-Site disaster management plan is as per the requirement of Schedule 12 of MSIHC Rules, 2000. Organizations involved responsibilities and liaison arrangements between them. Contact details of the various agencies will be prominently displayed.

3.1 City Fire Services

It is to combat fire and carry out other emergency operations as per the need. In case of fire, the fire brigade is the best help from outside. Even in a disaster not involving fire, the fire brigade could be of good help, inside the plant and outside, in view of their specialized equipment and expertise in rescue and relief.

Responsibilities;

- To reach the accident spot as soon as possible with all necessary equipment to extinguish the fire
- To provide all other necessary help depending on nature of emergency

3.2 Police

Police may be required to manage and control the mob, violence, sabotage or outbreak, if any, cordoning of the area and help in fire-fighting and other emergency operations. In case of emergency the police department has a number of functions to perform.

Responsibilities;

- Maintain law and order situation around the premises
- To control the traffic to facilitate the victims to reach hospitals as early as possible
- To restrict entry of any unauthorized persons
- To set up communication to assist in disaster management operation
- To take control of surrounding transport facilities and assist in disaster management operation by shifting injured persons and casualties to nearby hospitals
- Shifting injured persons and casualties to nearby hospitals
- To assist in fire-fighting and other emergency operations

3.3 Hospital

Hospitals are required to provide first aid, treatment, and also to arrange for removal of victims/casualties. Prompt and efficient medical aid is important in an emergency situation. The first center, inside the project complex, can't cope up with all the treatment requirements. The right approach to this problem is to have arrangements with nearby hospitals so that in case of an emergency, services and facilities available with the nearby hospitals can be utilized.

Responsibilities;

- Depute doctors and nurses to site with ambulance
- To provide immediate medical relief to casualties
- Augmentation of equipment, drugs and doctors
- To provide first aid on the spot to casualties
- To take all out efforts on war-footing to save maximum lives
- To continue treatment to casualties till all of them are attended and properly shifted to medical centers

3.4 District/Civic Administration

Civil administration is meant to provide overall supervision of all off-site emergency operations including order to evacuate off-site population. Local administration means those who are responsible for administration of the geographical area where the project is located.

Responsibilities;

- To protect the citizens
- To assess the situation for overall control
- To monitor the functioning and need of various agencies in rescue operation at site
- To requisite and make available the services and facilities available in the area like additional fire tenders, hospitals, doctors, transport, police, fire brigade, requisition of army and so on
- To coordinate the activities outside the project complex in view of their authority and experience in coordinating rescue and relief operations.

3.5 RTO

RTO services may be needed to clear all approach roads to and from accident area for free flow of vehicular traffic, which is engaged in combating the emergency, and demarcate parking area for vehicles to evacuate population.

3.6 Voluntary Organizations

Voluntary organizations should help in relief and humanitarian services to victims in case of any emergency.

Responsibilities;

- To assist in rescue operations and first aid to the victims.
- To arrange transport, refreshment and shelter
- To take necessary assistance from social organizations like Red Cross Society, Scouts, NCC, Rotary, Lions clubs, etc.,

3.7 Other project complexes near to the site

Other project complexes situated near the site should help to combat the emergency with the available equipment/infrastructure present in their locations.

Responsibilities;

- To provide the strongest possible support and resources to the facility managers so that the best accident prevention and emergency preparedness procedures are in place

- To encourage their facility managers to commit themselves fully to the awareness and preparedness for emergencies at local level process
- To monitor the involvement of their facilities in the process

STORM WATER HARVESTING

Rain water harvesting is the technique of collection and storage of rain water at surface or in sub-surface aquifer, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to ground water is a process by which the ground water reservoir is augmented at a rate exceeding that under natural conditions of replenishment.

1.0 Need

- a) To overcome the inadequacy of surface water/ground water to meet our demands.
- b) To arrest overuse, and, hence, decline in ground water levels.
- c) To enhance availability of water at specific place and time, and utilize rain water for sustainable development.
- d) To increase infiltration of the rain water in sub-soil which has decreased drastically in urban areas due to paving of open area.
- e) To improve ground water quality by dilution.

2.0 Advantages

- a) The cost of recharge to sub-surface reservoir is lower than that for surface reservoirs.
- b) The aquifer serves as distribution system also.
- c) No land is wasted for storage purpose and no population displacement is involved.
- d) Ground water is not directly exposed to evaporation and pollution.
- e) Storing water under ground is more environment friendly.
- f) It increases the productivity of aquifer.
- g) It reduces flood hazards.
- h) Effects rise in ground water levels.
- i) Mitigates effects of draught.
- j) Reduces soil erosion.

3.0 Design aspects

The important aspects to be looked into for designing a rainwater harvesting system to augment ground water resources are;

- a) Hydro-geology of the area including nature and extent of aquifer, soil cover, topography, depth to water level, and qualitative characteristics of ground water.
- b) The availability of source water basically assessed in terms of non-committed surplus monsoon runoff.
- c) Area contributing runoff like area available, land use pattern, industrial, residential, green belt, paved areas, roof top area, etc.
- d) Hydro-meteorological characteristics like rainfall duration, general pattern, and intensity of rainfall.
- e) All the rainwater will be used for ground water recharge. Surface runoff from green area and roads/pavements will not be directly allowed for ground water recharge. Instead, it will be collected, subjected to primary treatment as per the guidelines of the CGWA.

4.0 The System

- a) Storm water drainage and collection system
- b) Desilting (pre-clarification)/filtration chamber
- c) Water recharge system – trench with recharge wells

Whole of the complex area will be provided by a network of storm water drains. The drains will link water recharge system.

The drains will provide inlet to a pre-clarification/desilting chamber through a grating (screen) which will clarify the storm water and allow it to flow into respective trench of each recharge wells. The inlet water will sparge into an overflow trough (provided to avoid sloughing of sand layer) provided all along the inner periphery. Each trench will be provided with an outlet also. This will facilitate outflow of water to other wells in case a particular recharge trench gets filled/choked.

5.0 Salient features of the adopted recharge system

- a) In areas where large quantities of surface run-off is available, the use of trench/pits is made to store water in a filter media, and subsequently recharge to ground water through specially constructed recharge wells.
- b) Based in the lithology of the area, well assembly is designed with slotted pipes against the shallow and deeper aquifers.
- c) A lateral trench, of suitable size depending upon the availability of water, is constructed with the recharge well in the centre.
- d) The trench is backfilled with boulders, gravels, and coarse sand to act as a filter media for recharge wells.