



RISK ASSESSMENT

The objectives of carrying out Risk Assessment Study for any project is to study the risk involving hazardous chemicals and their consequences. Present project does not create any hazardous chemicals which will create risk to the human as well as environmental health. All efforts will be made to preserve trees including evaluation of minor design adjustments/ alternatives to save trees. Specific attention will be given for protecting giant trees, and locally important trees (religiously important etc.).

Tree cutting is to proceed only after all the legal requirements including attaining of In-principle and Formal Tree felling and forest land diversion permission from Forest Dept. under Forest Conservation Act, 1980. A clearance from the Forest Dept. and subsequently a written order is issued to the Contractor.

All environmental impact associated with the project which will be either avoid or minimized during planning stage if it is not possible then it will be compensated suitably, so that project will become eco-friendly.

1.1 Disaster Management Plan

India is prone to a large number of natural as well as man-made disasters. Disasters disrupt progress and destroy the hard-earned fruits of painstaking developmental efforts in quest for progress. Considering the consequences of past disasters priority has been given to preventive, mitigation and preparedness measures. Preparation of Disaster Management Plan (DMP) is a part of it.

Disasters can be due to human error or to rough weather conditions, they can cause serious injuries, loss of lives, and extensive damages to property and equipment. Most of the time disasters arise with no warning and sometimes they may not be controlled. The first few minutes determines the effectiveness of the emergency plan. Dealing with an emergency situation may require external aid. The quickest and well prepared the response is, the less likely there will be serious damages. Emergency planning enables to reduce the thinking time and thus permit to decrease the potentiality of damages. Emergency plans and equipment may never be used but they are essential. The key objectives of the disaster management plan are:

- Provide the framework for an integrated multi-agency crisis response to a significant disaster incident within the expressway
- Clarify specific roles and responsibilities
- Safest possible environment during the resolution of the incident
- Reduce the adverse impacts of an emergency incident on personal, business and the general community
- Provide a management framework for the sub plans and associated specific response plan
- Provide continued education review and testing.



1.2 Classification of emergencies

In an emergency situation defining the level of risk is the initial step. Classifying emergencies enable to understand quickly what is likely to happen and to what extent the emergency plans will be driven. The nature of the emergency refers as if it is a man-made disaster or a natural one and the level of an emergency refers to the intensity of potential damages.

1.3 Potential Emergencies

The potential emergencies likely to occur in a project area include:

| <input type="checkbox"/> Nature 1: Natural Disasters and Calamities | <input type="checkbox"/> Nature 2: Man-Made Disasters |
|---|---|
| <input type="checkbox"/> Flood <input type="checkbox"/> Cyclone <input type="checkbox"/> Coastal hazards: erosion/storm surge/tidal waves/swell waves <input type="checkbox"/> Earthquakes <input type="checkbox"/> Tsunami | <input type="checkbox"/> Fire and Explosion <input type="checkbox"/> Major release of flammable/toxic chemical or gases <input type="checkbox"/> Person falling in harbor water <input type="checkbox"/> Collapse of lifting appliances <input type="checkbox"/> War and terrorism <input type="checkbox"/> Industrial unrest <input type="checkbox"/> Oil Spill, |

1.4 Categorization of Emergency

Any emergency situation has to be first categorized as an onsite emergency or an offsite emergency, the difference being that the effects of the onsite emergency are confined within the premises while those of an offsite emergency spill over beyond the port premises or even beyond the project site premises. Thus, the onsite and offsite emergency plans are detailed below:

1.4.1 Onsite & Offsite Emergency Plans

These plans would have the following components:

| Components of an Onsite Emergency Plan | Components of an offsite emergency plan |
|---|--|
| <input type="checkbox"/> Formulation of Disaster Management Plan and Emergency Services <input type="checkbox"/> Organization Structure <input type="checkbox"/> Roles and Responsibilities of Emergency Teams <input type="checkbox"/> Communication <input type="checkbox"/> Emergency Control Centre <ul style="list-style-type: none"> • Alarm Systems & Assembly Points • Mutual Aid Scheme • Onsite Emergency Plan and Rehearsals • Spillage & Contingency Plan | <input type="checkbox"/> Identification of location of hazardous or dangerous substances, personnel and emergency control rooms <input type="checkbox"/> Technical information such as chemical and physical properties, dangers, etc. Background information, past accidents, control techniques and effects of hazardous materials of relevance <input type="checkbox"/> Identification of facilities and transport routes for toxic materials <ul style="list-style-type: none"> • Contact for further advice such as meteorological information, transport, temporary food and accommodation, first aid and hospital services, water, etc. • Establishing communication links including firefighting |



| Components of an Onsite Emergency Plan | Components of an offsite emergency plan |
|--|---|
| <ul style="list-style-type: none"> • Formulation of Disaster Management Plan for Cyclones | <p>materials, damage control and repair items</p> <ul style="list-style-type: none"> • Detailing emergency response procedures • Notification to public at large • Evacuation arrangements • Press / media handling • Addressing longer term environmental cleanup |

1.4.2 Onsite Emergency Plan (Formulation of DMP and Emergency Services)

The assessment of the risks and hazards leads either to improvements being made at the installation in the form, for example, of additional safeguards or better procedures, or the decision being taken that the risk is sufficiently small to be accepted. The DMP must be related to the final assessment and it is the responsibility of the expressway management to formulate it. The plan will include the following elements.

Assessment of the magnitude and nature of the events foreseen and the probability of their occurrence

- Formulation of the plan and liaison with outside authorities, including the emergency services
- Procedures for raising the alarm and communication both within and outside the port
- Appointment of key personnel and their duties and responsibilities (organizational structure)
- Emergency Control Centre
- Action on site and Action off site

1.5 Scenarios

Cyclonic storms: Storms vary in size and intensity, in severe situation port operations should be interrupted. High winds are particularly hazardous.

Earthquake: Project area falls under earthquake zone III which corresponds to a magnitude of 6.5 or more on the Richter scale. That means that the risk of earthquake and its consequences are non-negligible. Buildings and facilities construction must be designed to minimize the consequences of an earthquake.

Fire and explosion: A fire incident is described as the destruction or partial destruction by fire of a building or its contents. A fire spread can be very fast, to confine the fire to manageable limits the reaction must be very quick. Fire can also accrue due to road accident and sparking in running vehicle may also cause serious casualties.

Transportation Accidents: Transportation mishaps could endanger human lives, lead to chemical spills, fires, explosions and other problems. These emergencies may call for special operations such as evacuation and rescue. Usually transportation incidents affect only relatively small areas and involve only a small number of people.



1.6 Response Organization

1.6.1 General Action Plan

The primary role of the emergency response organization should be to determine the degree to which the emergency action plan should be activated, to coordinate the response and to assess the consequences. We can define three or four phases that composed an emergency action plan regarding the fact that there had been or not a warning.

- **First phase:** Planning and preparedness: This phase generally consist of constituting an emergency response team and making all the liaisons with all the parties susceptible to intervene. The number of person constituting the emergency response team will be based on the need to ensure safety to all port workers, property and equipment.
- **Second (optional) phase:** Action before effective period: It consists of ensuring that all the protective measures are well implemented. It is only possible when the danger has been identified by advance. Generally, the evacuation of the personnel which is not implicated in the emergency action plan takes place during this phase whenever possible.
- **Third phase:** Action during effective period: It consists of stopping all the activities at stakes and ensuring the safety of the employees, taking the action to minimize damages.
- **Action after effective period:** When the normalcy and safety of the area is ensured, it consists of making impacts assessment, undertake repairing measures and restart activities.

1.6.2 Assembly Point

A list of all the emergency assembly points should be made, notified on a plan and distributed to concern persons and employees. All personnel that are not involved in handling the emergency response should assemble at the appropriate assembly point.

1.6.3 Emergency Control Centre

The emergency control center should be established for expressway should be equipped with the following:

- An adequate number of external telephones. If possible, one should accept outgoing calls only, in order to bypass jammed switchboards during an emergency.
- An adequate number of internal telephones, Radio equipment/pager system.
- A layout plan of the facility.
- Location of possible spillage/fire points.
- Sources of safety equipment and other fire-fighting system elements.
- Escape Routes.
- A nominal roll of employees at the facility.
- A list of key personnel with addresses, telephone numbers, etc.



- An adequate number of personnel protective/safety equipment available on site / backup in warehouse or with other member groups of mutual aid program.

1.6.4 Alarm Systems

The emergency (due to fires or spillages) should be initiated by the first person noticing it by activating the fire alarm from the nearest call-point or by contacting the fire control room immediately on the internal telephone in case of any emergency.

1.6.5 Communication

Communication is a very important issue, a good communication that liaise all the services will enable a more effective response.

| Some means of Communication | |
|--|--|
| Inside include | With government authorities include |
| <input type="checkbox"/> Telephone <input type="checkbox"/> Mobile <input type="checkbox"/> Port announcement system <input type="checkbox"/> Wireless radio <input type="checkbox"/> Email <input type="checkbox"/> Emergency vehicles | <input type="checkbox"/> Telephone <input type="checkbox"/> Fax <input type="checkbox"/> E-mail <input type="checkbox"/> Emergency vehicles |

1.6.6 Training

Emergency response drills should be conducted once in a month, all types of siren codes should be exercised, and a clear notice should be distributed to all the employees.

1.6.7 Reporting and investigation

Reporting: Any minor or major incident should be reported and a complete analysis of the incident should be done to understand causes, consequences and the level of failure. Special procedure and forms should be provided for this purpose (Incident report form, Work injury report etc.). A report should also be provided to government authorities.

Investigation: Each incident should be investigated to identify the causes, take appropriate preventive measures and comply with requirements. Special procedures and forms should also be provided for investigation.

Individual Plans: Following are proposed general mitigation measures for emergency action plan related to the disasters described above.

