

# Chapter-7

## Risk and disaster Management

### RISK AND DISASTER ASSOCIATED WITH JETTY OPERATION

#### 7.1 On-site emergency plan

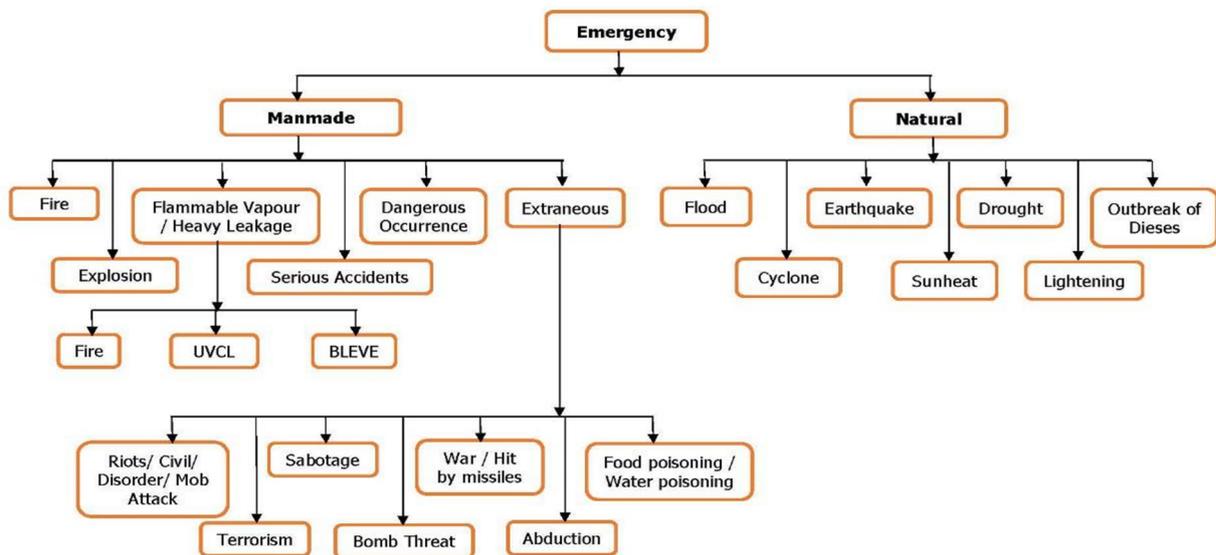
The emergency is an undesirable occurrence of events of such magnitude and nature that adversely affect production, cause loss of human lives and property as well as damage to the environment. The emergency may be man-made or natural type. The production unit has to be prepared against such emergency/disaster and consequences.

It is difficult to forecast the time and nature of emergency, which might strike the unit. In spite of the fact that every industry is expected to take steps to assess, minimize and wherever feasible eliminate risks, accidents may occur, as risk can only be minimized, it can never be totally eliminated.

#### 7.2 Classification of Emergency/Disaster

Jetty and harbour area are vulnerable to various kinds of natural and man-made emergencies. Examples of Natural disasters are, Cyclone, earthquake, lightening etc. and manmade disasters like major fire, explosion, etc. Thus, the emergency can be divided in the following types, depending upon the nature:

Figure 1-1 Nature of the Emergency



#### 7.1 Industrial Emergency / Disaster Plan

While preparing the emergency plan, worst possible scenario of the accident or incident of the jetty should be considered. Controlling the emergency will require prompt action by the operating staff, the staff of various agencies, emergency teams and outsiders when called for. Minimizing the effect on people may be achieved by prompt

communication, rescue, evacuation etc., if the situation so warrants. However, an effective emergency plan helps to minimize the losses in terms of human lives, plant assets and environmental damage and to resume the working condition as soon as possible. In all these steps "*Speed is the Essence*".

## **7.2 Stages of the Plan**

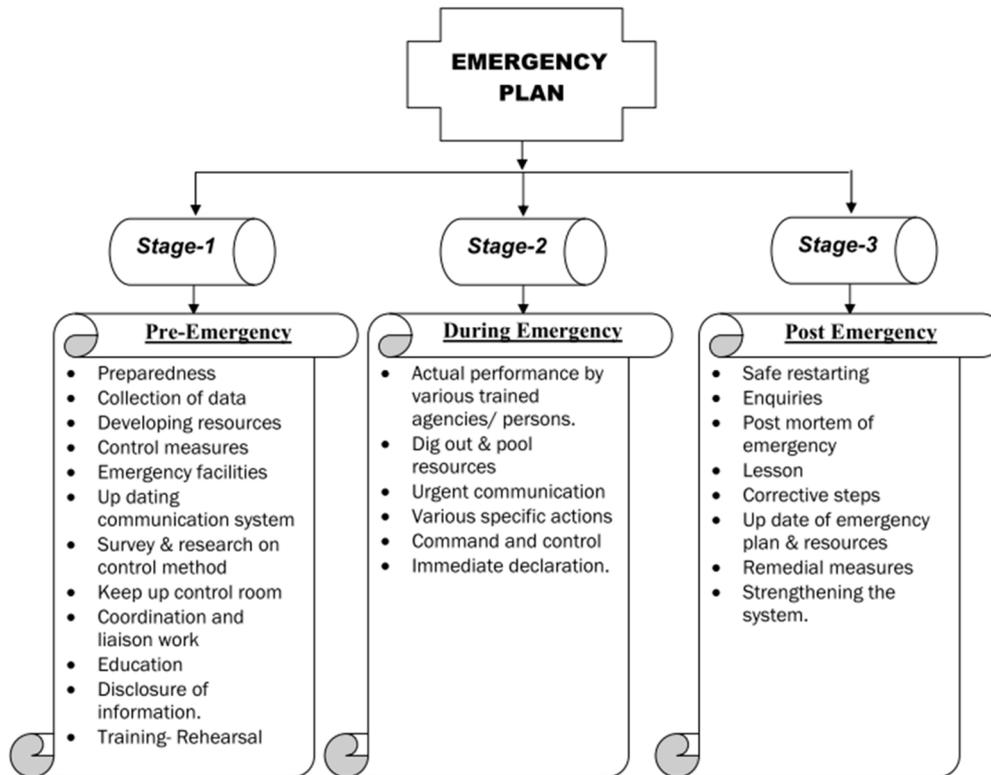
The plan consists of the actual performance of duties & responsibilities by designated personnel and other agencies. Therefore, the plan is divided into three stages. The stage one is pre-emergency period i.e. Normal activities before emergency or preparedness, awareness and training parts.

While stage second explains actions during emergency period i.e. during actual emergency period, specific duties are to be performed by designated personnel, using available resources & control measures in systematic ways.

The third stage indicates post emergency period, which describes how to safe rehabilitation, restarting, to face inquiry, to preserve evidences and records for remedial measures etc.; as required by various authorities. It also explains corrective steps from the incident and finding out the correct reason behind the emergency, so that such type of incident will not occur again.

The chart of emergency plan, explaining how entire arrangement is required to manage, is produced below;

**Figure 1-2 Emergency plan**



### **7.3 Level of the Emergency**

The level of Emergency can be classified according to the gravity of the situation at site. The command and control will follow as per the level of emergency.

#### **7.3.1 Level-I: On-Site Emergency**

The type of emergency, which can be handled and controlled by the management with own resources as per On-site emergency plan, is called as On-site or Level-I.

#### **7.3.2 Level-II: Mutual Aided / Local crisis (Off-site)**

If the Level-1, is uncontrollable by the management, further help is needed, the neighbouring units or mutual aided local units will provide their resources to tackle the situation. The emergency of the unit which is handled and controlled by the outside resources is called as Mutual Aided local crisis or Level-II. Further, if this type of emergency is governed by Local Crisis Group then it is called as Local Crisis or Level-2.

#### **7.3.3 Level-III: District Crisis (Off-site)**

Even after putting efforts as explained in Level-II, the situation becomes uncontrollable and beyond the control of Local Crisis Management, than the District Crisis Group will take over the charge & handle the emergency situation. This is termed as Level-III or District Crisis.

#### **7.3.4 Level-IV: State Crisis / National Crisis (Off-Site)**

If gravity and situation of the emergency is beyond control of Local or District Crisis Group, The State/National Crisis Group has to command and control such crisis by utilizing all resources from the State or Nation, as prevailing circumstances, and then it is called as State Crisis or National Crisis.

## **7.4 Emergency Management & Response**

### **7.4.1 Introduction**

There are two types of emergency control plans, (1) On site emergency plan and (2) Off site emergency plan/Disaster plan. On Site Emergency Plan is to be prepared by Indian Coast Guard Unit under the guidance of the Government and local Authority, with compliance under statutory provisions. Offsite Emergency Plan is to be prepared by the Local Authority and the Government itself with the help of the Government machineries and emergency resources including the concerned industrial units also.

### **7.4.2 Type of Probable Emergency**

Considering the jetty operation, any type of emergency may strike out; as described below:

#### **7.4.2.1 Fire**

There are many sources for fire i.e.

- During movement or transportation of
- Vessel refueling operation, vessel operation Electricity short Circuit, etc.

#### **7.4.2.1.1 Emergency Management**

The emergency management plan includes clearly stating the line of command, each person's specific responsibilities, and organizational set up available to tackle the emergency effectively. The command & control will be single structure, till emergency controlled. The personnel from the organization involved in emergency response management are identified as Designated Person.

In order to effectively achieve the objectives of emergency planning, the critical elements that form the back bone of On Site emergency plan are;

- Reliable and early detection of an emergency & control planning
- The command, Co-ordination and response management structure along with efficient trained personnel
- The availability of resources for handling emergency
- Appropriate emergency response action
- Effective notification & communication facilities
- Regular review and updating of documents

- Proper training to the concerned personnel
- Periodical Mock-Drill/Exercise/Rehearsal
- Jetty/

#### **7.4.2.1.2 Infrastructure**

#### **7.4.2.1.3 Assembly Point**

The Assembly Point will be marked at a conspicuous place, i.e. near security office and entry gate. The non-essential workers include employees, who have no any duties /responsibilities allotted, contractor's person, vendors, visitors etc. have to rush at specified Safe Assembly Point, as announced, or they have to go at Assembly point as directed by IC/ Security/ Control Room, or rush to well away from areas of risk and least affected by the down wind direction. They have to report their presence to the person attending duty.

#### **7.4.2.1.4 Emergency Control Centre (ECC)**

ECC is Communication Centre during the emergency. The senior and expert person shall be posted as In Charge of the ECC. ECC shall be safe & without risk. The particulars like On Site Emergency Plan, Plan –layout of the Unit, maps, drawing, operations, emergency telephone with contact person, Manual, Weather details, List of essential workers & key person etc. details shall be kept available at the ECC and in-charge shall ensure the availability of such documents while taking charge. The communication Team under the In-charge will carry out the all works.

SMC will activate ECC by posting proper person, who obey and perform the emergency duties, in two folds, internal, like- sounding the siren, alert the workers/persons regarding type of emergency and response actions, direction to safe assembly point/shelter, by emergency communication system. Further, external to emergency communicate to the authorities, surrounding people and industries, type of helps/source required from outside and other required matter for emergency purpose. In-charge of ECC will be constant touch with SMC/I.C.

#### **7.4.2.1.5 Alarm & Siren**

Workers and other persons are engaged in their work, they should be alerted to save life and rush to the safe area, in case of emergency arise.

Thus, siren or public address system or any device is useful to alert the workers immediately; siren installed at jetty whereas loud speaker at barrage, where it can be heard to all the employees.

#### **7.4.2.1.6 Wind Sock**

Wind Sock shall be installed at the highest point, where any person can see and can observe the direction of wind.

#### **7.4.2.1.7 Emergency Facility**

The various types of equipments, appliances, facilities, etc. are to be utilized during the emergency, which depends upon type of emergency. Therefore, the emergency facilities shall be ascertained & listed according to the hazardous chemical being stored, handled or processed including quantities. Further, it should be ensured by the concerned person that the sufficient inventories should be maintained & keep in order to handle the emergency successful. Ensure the availability of PPEs, Safety equipment, Neutralizing Agents, D. G. Set., adequate supply of water, man power, etc. The emergency details are given

**Table 1-1 Proposed Personnel Protective Equipments**

S. No.	Name	Quantity
1.	Helmet	As per requirement
2.	Safety Goggles	As per requirement
3.	Life jacket	08 nos for each barge
4.	Ring buoy	08 nos for each barge
5.	Safety Shoes	As per requirement
6.	Safety Belt	As per requirement
Other Equipment		
7.	Safety Torch	As per requirement
8.	First Aid Box	As per requirement

#### **7.4.2.1.8 Emergency Medical Services**

Emergency Medical Treatment, medicines, antidotes, list of hospitals etc. shall be kept ready. FMO shall arrange casualty receiving centre, para-medical staff, colour code-badges (injury wise identification of persons), Register to maintain attended patient, required antidotes etc.

#### **7.4.2.1.9 Resources**

The following resources shall be available in adequately, working condition & updated for the emergency purpose.

- Emergency Power Supply-D.G. Set
- Fire Protection Systems (as given in Emergency Facility)
- Emergency Communication System
- Storage of Fire-Water & Availability of source of water
- Personnel Protective Equipment & Safety Equipment
- Emergency Medical Treatment & Antidotes
- Weather details
- List of trained person in firefighting, first aid & expert person

- List of emergency equipment suppliers, medicines suppliers, hospitals, water resources, etc.
- Mutual Aiders list with contact person
- Emergency Telephone Numbers, etc.

#### **7.4.2.1.10 Communication during Emergency**

On declaration of On-Site Emergency by ICS /Authorised Person, In-charge- person of Emergency Control Centre immediate communicate through emergency communication system (Emergency telephone, Mobile, e-mail, Messenger, wire-less, Megaphone, siren, hooter, inter-com-phone, etc.):

- By sounding siren/announcing according to the type of on-site emergency/ off-site emergency
  - Inform to Fire-Services to rush with specific responding equipment
  - Inform internally to the Designated Persons, Key Persons, Essential Workers, Officers, FMO, to report to SMC/IC immediately and start responding actions under intimation to SMC/IC
  - Inform internally to workers, non-essential persons; directing to go to the Safe-Shelter, and report to authorized person their presence
  - Intimate regarding emergency situation to Police, (DISH)/Factory-Inspector, Collector, DCG, LCG, other Govt. Authorities
  - Inform the Govt./Pvt hospitals for making necessary arrangement
  - Inform to the relatives of injured or death persons, if so
  - Report to SMC/IC time to time and comply any pending or as directed by SMC/IC
  - To maintain the records for all communications
  - On withdrawal of emergency, it shall be communicated to all respective department/section, Key persons, Essential Workers, Assembly Point, Govt. Authorities, etc.

#### **7.4.2.1.11 Liaison Arrangement with Organization**

At the time of emergency, different types of help, services and cooperation from various emergency services like fire, police, medical, Govt. organizations/department, Private organizations, surrounding industries, out-side-experts, various suppliers, hospitals-authorities, medicines suppliers, special equipment suppliers, etc. are be essentially utilized on urgent need base. Liaison with all type of organizations/person shall be made with their name of contact person with phone/ mobile numbers, residential address, etc. and upto date record shall be maintained with ECC and responsible persons.

#### **7.4.2.2 Earthquake**

##### **7.4.2.2.1 During Earthquake, if Indoors:**

If possible escape to nearby open area away from electrical lines or other tall structures/ trees.

Take cover under a piece of heavy furniture or against an inside wall and hold on.

Stay inside.

The most dangerous thing to do during the shaking of an earthquake is to try to leave the building because objects can fall on you.

#### **7.4.2.2 During Earthquake, if Outdoors:**

Move into the open, away from buildings, street lights, and utility wires.

Once in the open, stay there until the shaking stops.

#### **7.4.2.2.3 During Earthquake, if in a moving vehicle:**

Stop quickly, park the vehicle on left side of the road, and if possible escape to nearby open area away from electrical lines or other tall structures/ trees.

Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

#### **7.4.2.2.4 After Earthquake**

Be prepared for aftershocks. 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.

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.

Listen to a battery-operated radio or television for the latest emergency information.

Remember to help your neighbors who may require special assistance—infants, the elderly, and people with disabilities.

Stay out of damaged buildings.

Return home only when authorities say it is safe.

Use the telephone only for emergency calls.

Clean up spilled chemicals or other flammable liquids immediately. Leave the area if you smell gas or fumes.

### **7.4.2.3 Thunderstorm & Lightning Strikes**

#### **7.4.2.3.1 Before**

Thunderstorm is invariably accompanied by lightning. A single stroke of lightning has 125,000,000 volts of electricity. That's enough power to light a 100-watt light bulb for

more than 3 months, or enough to seriously hurt or to kill someone. Know what steps to take in the event of an oncoming thunder storm & lightning. Lightning is something you should not be careless about, so seek a safe shelter immediately! Be warned, lightning can and does strike just about any object in its path. When you see lightning, follow these safety rules.

#### **7.4.2.3.2 Indoors**

Stay or go indoors, if you hear thunder, don't go outside unless absolutely necessary. Stand clear from windows, doors, and electrical appliances.

Stay away from anything that could conduct electricity. This includes electric lines, Electric Instruments, wires etc. and phones. Unplug appliances well before a storm strikes.

Don't use any plug-in electrical appliances like Cell phones, TV, music system, mixer, blender, iron press, hair dryer, or electric razor etc. If lightning strikes your house, these electrical / electronic gadgets can conduct the charge to you.

Don't use the telephone during the storm. Lightning may strike telephone lines outside. Use the telephone quickly only for emergency purposes. Avoid contact with piping including sinks, baths and faucets.

#### **7.4.2.3.3 Outdoors**

When outdoors, seek shelter from lightning! Buildings are best for shelter, but if no buildings are available, you can find protection in a cave, ditch, or a campus. Trees are not good cover. Tall trees attract lightning. Never use a tree as a shelter.

Stay in your vehicle if you are travelling, vehicles give you excellent lightning protection. Get in a hard topped car.

If you can't find shelter avoid the tallest object in the area. If only isolated trees are nearby, your best protection is to crouch in the open, keeping the distance twice the height of isolated trees. Avoid areas that are higher than the surrounding landscape.

Don't use metal objects outside. Keep away from metal objects including bikes, electric or telephone poles, fencing, machinery etc.

Get out of the water. Immediately get out and away from pools, lakes, and other bodies of water.

When you feel the electrical charge – if your hair stands on end or your skin tingles- lightning may be about to strike near you. Immediately crouch down and cover your ears. Do not lie down or place your hands on the ground.

Victims of lightning shock are administered Cardio pulmonary resuscitation (CPR) i.e. artificial respiration, if necessary. Seek medical aid.

#### **7.4.2.4 Cyclone/ Hurricane**

### 7.4.3 General

The nature of a cyclone provides for more warning than other natural and weather disasters.

### 7.4.4 Preparation

Stay calm and await instructions from the Emergency Coordinator or the designated officials.

Continue to monitor local TV and radio stations for instructions.

Move early out of low-lying areas, at the request of officials.

If you are on high ground, plan to stay, secure the building, moving all loose items indoors and close windows and openings.

Collect drinking water in appropriate containers.

### 7.4.5 Warning

Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.

### 7.4.6 During a Cyclone

Remain indoors and consider the following:

Small interior rooms on the lowest floor and without windows,

Remain on the lowest floor away from doors and windows, and Rooms constructed with reinforced concrete, brick, or reinforced blocks with no windows.

Stay away from outside walls and windows.

Use arms to protect head and neck.

Remain sheltered until the cyclone threat is announced to be over.

### 7.5 Disaster Management Plan (DMP)

The main disaster associated with the Indian Coast Guard vessels, which acts only as berthing phase for the coast Guard vessels are Collision with other ships or fishing vessels during the routine patrolling services and Ship grounding frequency

These aspects are covered in details in the NIO marine EIA report

**Ship Grounding Frequency:** Please refer NIO marine EIA report section 5.2.3

**Ship Collision Frequency:** Please ref NIO marine EIA report section 5.2.2

**Vessel traffic and Port Management** Please refer Section 2.9 of Marine EIA report

**Oil spill management** please refer NIO Marine EIA report Section 2.13