8.0 DISASTER MANAGEMENT PLAN

8.1 INTRODUCTION
The objective of any plant should be safe and trouble free operation and smooth production. This is ensured by taking precautions right from design stage i.e. design of plant, equipment/pipeline as per standard codes, ensuring selection of proper material of construction, well designed codes/rules and instruments for safe operation of the plant. Safety should be ensured afterwards by operating the plant with the help of trained manpower. In spite of all precautionary measures taken, accidents may happen due to human error or system malfunction. Any accidents involving release of hazardous material may cause loss of human lives & property and damage to environment. Industrial installations are vulnerable to various natural as well as man made disasters. Examples of natural disasters are flood, cyclone, earthquake, lightening etc. and manmade disasters are like major fire, explosion, sudden heavy leakage of toxic and poisonous gases and liquids, civil war, nuclear attacks, terrorist activities etc. The damage caused by any disaster is determined by the potential for loss surrounding the event. It is impossible to predict the time and nature of disaster, which might strike on undertaking. However, an effective disaster management plan i.e. pre-planned procedure involving proper utilization of in-house as well as outside resources helps to minimize the loss to a minimum and resume the working condition as soon as possible.

8.2 STATUTORY REQUIREMENT
Disaster Management Plan is a statutory requirement for IOCL Moinarband, Assam Depot. The applicable regulations are:

a) *Factories Act, 1948* and as amended
8.3 OBJECTIVE OF DISASTER MANAGEMENT PLAN

Disaster Management Plan is basically a containment, Control & mitigation Plan. The plan includes activities before disaster, during disaster and post disaster:

The objective of disaster management plan is to formulate and provide organizational set up and arrange proper facilities capable of taking part and effective action in any emergency situation in order to:

a) Brief the incident under control making full use of inside and outside resources
b) Protect the personnel inside the depot as well as public outside.
c) Safeguard the depot as well as outside property and environment.
d) Carry out rescue operation and treatment of casualties.
e) Preserve relevant records and evidences for subsequent enquiry
f) Ensure rapid return to normal operating conditions.

The above objectives can be achieved by –

i) Proper identification of possible hazards and evaluation of their hazard potential and identification of maximum credible hazard scenario.
ii) Arrange/ augment facilities for fire fighting, safety, medical (both equipment and manpower)
iii) Evolving proper action plan with proper organizational set-up and communication facilities as well as warning procedure.

8.4 DEFINITIONS

Disaster
Disaster is a general term, which implies a hazardous situation created by an accidental release or spill of hazardous materials, which poses threat to the safety of workers, residents in the neighborhood, the environment or property.
Emergency

Emergency condition and Disaster Condition are synonymous.

**ON-SITE Emergency/Disaster**

In an On-Site Emergency the effect of any hazard (fire/ explosion/ release of toxic gases) are confined within the factory premises. An accident taking place inside the depot and its effects are confined within the boundary wall.

**OFF-SITE Emergency/Disaster**

In case of any hazard inside IOCL, Moinarband- Assam Depot, the effects that are also felt outside the boundary wall.

8.5 DESCRIPTION OF INDUSTRIAL ACTIVITY

Name and Address of the person furnishing the information

In charge Moinarband Depot,
Indian Oil Corporation Ltd;
Vill.: Silchar; P.S: Cahar
Distt: Cachar
Assam.

a) Site Location

The Moinarband POL Depot is located in the state of Assam, at about 3 Km from Silchar. Land measuring 45.74 acres of Moinarband POL Depot and is strategically placed at 1.5 Km from NH -54 & 5 Km from Silchar railway station.

b) Population around Site

The location is called Moinarband and is thinly populated area. As such there are one stone crusher on both left & right side of the main plot.

c) Activities & Facilities

Brief descriptions of the activities to be performed in Moinarband, POL depot are as follows:

i) Receipt of the petroleum products e.g. MS, SKO, HSD and ATF through Tank wagons.

ii) Storage of these products in storage tanks
## Disaster Management Plan

**MS Tanks:** 3x1810 KL (FRVT)
**SKO Tanks:** 2x 3754 KL (CRVT)
**HSD Tanks:** 4x 3754 KL (CRVT)
**ATF Tanks:** 3x 938 KL (CRVT)

### iii) Pump House

Electrical driven centrifugal pumps for the loading of Road tankers are to be provided.

<table>
<thead>
<tr>
<th>Product</th>
<th>No. of Pumps</th>
<th>Pump House</th>
<th>Discharge (KL/Hr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD</td>
<td>2</td>
<td>TLF</td>
<td>324</td>
</tr>
<tr>
<td>SKO</td>
<td>2</td>
<td>TLF</td>
<td>144</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>TLF</td>
<td>216</td>
</tr>
<tr>
<td>ATF</td>
<td>2</td>
<td>TLF</td>
<td>144</td>
</tr>
<tr>
<td>HSD</td>
<td>2</td>
<td>TWD</td>
<td>-</td>
</tr>
<tr>
<td>SKO</td>
<td>2</td>
<td>TWD</td>
<td>-</td>
</tr>
<tr>
<td>MS</td>
<td>2</td>
<td>TWD</td>
<td>-</td>
</tr>
<tr>
<td>ATF</td>
<td>2</td>
<td>TWD</td>
<td>-</td>
</tr>
</tbody>
</table>

### iv) Tank Lorry Filling

Tank Lorries are to be filled in filling bays by pumping products from storage tank to filling bays. 12 Nos. of bays are provided for this purpose. The discharge pipeline branches are connected to tank Lorries by loading arm through a flow control valve and flow meter. The tank Lorries are properly earthed before receiving the petroleum products.

## 8.6 SAFETY RELATED UTILITIES

### i) Water

Fire water requirement will be as per norms of *OISD-117*.

Water Storage Facilities: As per *OISD-117*

Facility to be made available: Water Tanks (3x3000 KL]

Source of Water: Bore wells to be made for sourcing Ground Water.

Fire hydrants/monitors are provided in all the vulnerable areas of the plant.

Sprinkler system for water spray cooling is to be provided for MS storage tanks

### ii) Power

The power requirement of the depot will be by State Electricity Board and Emergency power through DG Sets.
8.7 DISASTER PLANNING

Modern approach to disaster management plan involves

a) Risk analysis Study
b) Action Plan

Risk analysis study involves

a) Risk Identification
b) Risk Evaluation

Risk identification involves

i) Identification of hazardous events in the installation, which can cause loss of capital equipment, loss of production, threaten health and safety of employees, threaten public health and damage to the environment.

ii) Identification of risk, important processes & areas to determine effective risk reduction measures

Risk evaluation involves calculation of damage potential of the identified hazards with damage distances (which is termed as consequence analysis) as well as estimation of frequencies of the events.

Hazardous areas with different hazard scenarios and their damage potential with respect to fire & explosion have already been mentioned in earlier section. However, failure rate of different hazard scenarios has been discussed broadly based on data available for similar incidents outside India.

Probability of any hazardous incident and the consequent damage also depends on –

a) Wind speed
b) Wind direction
c) Atmospheric stability
d) Source of ignition and also
e) Presence of plant assets & population exposed in the direction of wind.

Action plan depends largely on results of risk analysis data and may include one or more of the following:

a) Plan for preventive as well as predictive maintenance.
b) Augment facilities for safety, fire fighting, medical (both equipment and manpower) as per requirements of risk analysis.

c) Evolve emergency handling procedure both on-site and off-site.

d) Practice mock drill for ascertaining preparedness for tackling hazards/emergencies at any time (day or night).

8.8 IDENTIFICATION OF HAZARDS

8.8.1 General Nature of Hazard

In Moinarband Depot petroleum products to be handled are highly inflammable and also have explosive properties.

Any small fire in the installation, if not extinguished at early stage can cause large scale damage and may have a cascading effect. Hence the terminal requires.

a) A quick responsive containment and control system requiring well planned safety and fire fighting system.

b) Well organized trained manpower to handle the process equipment & systems safely.

c) Well trained personnel to handle safety and fire fighting equipment to extinguish fire inside the installation promptly as well as tackle any type of emergency.

d) Well planned Disaster Management Plan.

8.8.2 Hazards Areas of the Plant

The plant activities handling petroleum products can be subdivided into the following:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Receipt of petroleum products</td>
<td>i) Tank Wagon Decantation Bay.</td>
</tr>
<tr>
<td>b) Petroleum products storage</td>
<td>i) Tank Farm Area</td>
</tr>
<tr>
<td>c) Petroleum products pumping</td>
<td>i) Pump House</td>
</tr>
<tr>
<td>d) Dispatch of petroleum products</td>
<td>i) Road Tanker Loading Bay</td>
</tr>
</tbody>
</table>

8.8.3 Hazard Scenarios and effects.

This has been discussed in detail in the Chapter on Risk Analysis. However, a brief outline is given in the following table:
Disaster Management Plan

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Failure Scenarios</th>
<th>Likely Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Storage tanks on Fire</td>
<td>Thermal Radiation</td>
</tr>
<tr>
<td></td>
<td>i) MS Tank</td>
<td>i) MS Tank</td>
</tr>
<tr>
<td></td>
<td>ii) SKO Tank</td>
<td>ii) SKO Tank</td>
</tr>
<tr>
<td></td>
<td>iii) HSD Tank</td>
<td>iii) HSD Tank</td>
</tr>
<tr>
<td></td>
<td>iv) ATF Tank</td>
<td>iv) ATF TEL</td>
</tr>
<tr>
<td>2)</td>
<td>Vessel connection failure of inlet / outlet lines for MS, SKO, HSD and ATF tanks</td>
<td>Thermal radiation for MS, SKO, HSD &amp; ATF and also VCE for MS.</td>
</tr>
<tr>
<td>3)</td>
<td>TLF Pumps discharge lines full bore failure for MS, SKO, HSD and ATF</td>
<td>- do -</td>
</tr>
<tr>
<td>4)</td>
<td>TWD Unloading Hose failure for MS, SKO, HSD and ATF</td>
<td>- do -</td>
</tr>
<tr>
<td>5)</td>
<td>Gasket failure in TLF pump discharge line MS, SKO, HSD and ATF (Tank lorry loading Pump)</td>
<td>- do -</td>
</tr>
<tr>
<td>6)</td>
<td>Failure of 2.5&quot; dia loading arm for road tanker loading of (i) MS (ii) SKO (iii) HSD &amp; (iv) ATF</td>
<td>- do -</td>
</tr>
<tr>
<td>7)</td>
<td>Mechanical seal failure of MS, SKO, HSD and ATF pumps for Tank Lorry Filling (TLF)</td>
<td>- do -</td>
</tr>
<tr>
<td>8)</td>
<td>Hole in TLF pump Discharge line of (i) MS (ii) SKO (iii) HSD &amp; (iv) ATF</td>
<td>- do -</td>
</tr>
</tbody>
</table>

All the scenarios are having damage potential to a different degree. However, maximum damage can happen due to storage tank pipeline connection failure or in case of tank fire.

In all the above cases fire/ explosion can occur due to ignition of the vapour of petroleum products coming out from the containment. The sources of ignitions may be (I) Hot work in the vicinity (ii) Smoking (iii) Lightening (iv) Generation of static electricity (v) Radiant heat from outside. (v) Deliberate ignition or sabotage (vi) By the ignition of dry grass in the dyke area.

8.9 Safety Measures

Some of the preventive & pre-emptive measures which are to be taken during operational phase are as follows:

a) Safety measures

Following safety tips should always be borne in mind while working in the plant to avoid emergency & hazardous situation.

i) Follow specified procedures and instructions for start-up, shut down and any maintenance work.
ii) Follow permit to work system.
iii) Identify correctly the part of the plant in which work is to be done.
iv) Isolate the part, machine properly on which work is to be done.
v) Release pressure from the part of the plant on which work is to be done.
vi) Remove flammable liquid/ gases thoroughly, on which work is to be done.
vii) Use non-sparking tools.

b) **Plant Inspection**

Apart from planned inspection, checks and tests should be carried out to reduce failure probability of containments.

i) Storage vessels and pipeline should be checked regularly during both their construction and operational phase.
ii) Critical trips, interlocks & other instruments should be checked regularly to avoid fail danger situation.
iii) Fire fighting system should be checked regularly to ensure proper functioning during emergency situation.
iv) Proper lightening protection system should be provided and checked regularly to avoid lightening effect.

c) **Performance or Condition Monitoring**

A systematic monitoring of performance or condition should be carried out especially for large machines and equipments, which may be responsible for serious accidents/ disaster in case the defined limits are crossed.

i) Vibration, speed & torque measurements for pumps, DG sets etc.
ii) Thickness and other flaw measurements in metals of storage vessels, Inlet & Outlet lines from storage vessels etc.

Many types of non-destructive testing/ condition monitoring techniques are available. X-ray radiography, acoustic emission testing, magnetic particle testing, eddy current inspection techniques etc. are to be used for detection of flaws & progression of cracks in metals. Testing equipments are also there for checking vibration, speed, torque etc.
Disaster Management Plan

The above condition monitoring techniques should be applied regularly by internal/external agencies. Immediate corrective measures should be taken if any flaws are detected.

d) **Preventive Maintenance**
A schedule for preventive maintenance for moving machineries should be prepared based on experience in other similar plants as well as instruction of the suppliers. The schedule should be followed strictly during operation as well as planned shut down period.

e) **Entry of Personnel**
Entry of unauthorized personnel is strictly prohibited inside the premises. The persons entering the plant should not carry matches, lighters, mobile phone etc.

f) **Hot work**
Hot work should not be permitted except in-designated areas with utmost precaution and proper work permit.

8.9.1 **Details of Fire Fighting Facilities**
Modern fire fighting facilities are to be provided in the depot in line with norms of *OISD*.

i] **Fire Hydrant System**
The entire area is provided with a looped fire hydrant pipeline connected to fire engines on auto system and always kept under pressure to meet emergencies. Three numbers of fire water storage tanks are to be provided. The source of water will be bore wells provided inside the depot. The fire hydrant line have to be equipped with required numbers of single/double headed hydrant valves, monitors and hoses. The system can also be connected to foam making branches for generating foam for extinguishing the fire.

ii] **Sprinkler System**
Water sprinkler system with spray nozzles are to be provided for MS storage tanks for cooling the tanks if required.
iii] **Portable Fire Fighting Equipments**

Following portable firefighting equipment will be provided in the plant as per OISD-117:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Type of Area</th>
<th>Scale of Portable Fire Extinguisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Storage of (Class A/B) in packed containers and stored in open/ closed area.</td>
<td>1 No. 10 Kg DCP extinguisher for 100m² or min. 2 Nos. in each storage area whichever is higher</td>
</tr>
<tr>
<td>ii)</td>
<td>Pump House (Class A/B) up to 50 HP Above 50-100 HP Beyond 100 HP</td>
<td>1 No. 10 Kg DCP for 2 pumps. 1 No. 10 Kg DCP for each pump 2 Nos. of 10 Kg or 1 No. of 25 Kg DCP for each pump.</td>
</tr>
<tr>
<td>iii)</td>
<td>Tank Truck loading &amp; unloading gantry for POL/ Special products</td>
<td>1 No. 10 Kg DCP extinguisher for each bay plus 1 No. 75 Kg DCP extinguisher for each gantry.</td>
</tr>
<tr>
<td>iv)</td>
<td>A/G Tank Farm</td>
<td>2 Nos. 10 Kg DCP extinguishers for each tank plus 4 Nos. 25 Kg DCP extinguishers for each Tank Farm positioned at four corners. In case of adjoining tank farms, the no. of 25 Kg extinguishers can be reduced by 2 Nos. per tank farm.</td>
</tr>
<tr>
<td>v)</td>
<td>U/G Tank Farm</td>
<td>2 Nos. 10 Kg DCP extinguishers for each Tank Farm.</td>
</tr>
<tr>
<td>vi)</td>
<td>Fire Pump Houses</td>
<td>1 No. Kg DCP extinguisher for every two pumps or min. 2 Nos. 10 Kg DCP extinguisher for each pump house whichever is higher.</td>
</tr>
<tr>
<td>vii)</td>
<td>Admin. Building/ Store Room</td>
<td>1 No. 10 Kg DCP extinguisher for every 200m² or min. 2 Nos. 10 Kg DCP extinguisher for each floor of building/ store whichever is higher.</td>
</tr>
<tr>
<td>viii)</td>
<td>DG Room</td>
<td>2 Nos. each 10 Kg DCP &amp; 4.5 Kg CO2 extinguishers for each DG room.</td>
</tr>
<tr>
<td>ix)</td>
<td>Main Switch Room/ Sub-Station</td>
<td>1 No. 4.5 Kg CO2 extinguisher for every 25 m² plus 1 No. 9 Liter sand bucket</td>
</tr>
<tr>
<td>x)</td>
<td>Security Cabin</td>
<td>1 No. 10 Kg DCP extinguisher per cabin.</td>
</tr>
<tr>
<td>xi)</td>
<td>Canteen</td>
<td>1 No. 10 Kg DCP extinguisher for 100m²</td>
</tr>
<tr>
<td>xii)</td>
<td>Effluent Treatment Plant</td>
<td>1 No. 75 Kg &amp; 2 Nos. 10 Kg DCP extinguisher</td>
</tr>
<tr>
<td>xiii)</td>
<td>Transformer</td>
<td>1 No. 75 Kg &amp; 2 Nos. 10 Kg DCP extinguisher.</td>
</tr>
<tr>
<td>xiv)</td>
<td>UPS/ Charger Room</td>
<td>1 No. 2 Kg CO₂ extinguisher.</td>
</tr>
<tr>
<td>xv)</td>
<td>Control Room</td>
<td>2 Nos. 2.5 Kg Clean Agent and 1 No. 4.5 Kg CO₂ extinguisher.</td>
</tr>
</tbody>
</table>
iv] **Personal Protective Equipments (PPE)**

Following PPEs will be provided in Sufficient Numbers:

i) Safety Helmets

ii) Safety Shoes

iii) Safety Glasses

iv) Asbestos & Rubber Hand Glass

v) Fire Proximity Suit

vi) SCABA

vii) Ear Plug or Ear Muff

viii) Stretcher

8.9.2 **Emergency Control Centre & Shelter Room**

The emergency control centre shall be situated in the office building. The office room of Terminal In-charge shall be designated as Emergency Control Centre. P&T telephones, Alarms, Emergency Control Manual & Safety and Personal Protective Appliances are to be arranged in sufficient numbers and kept in the room.

**Emergency Shelter**

The room has to be built outside the licensed area for giving shelter to employees/other personnel who are not involved in emergency control actions.

8.9.3 **Alarm and Communication System**

A] **Alarm System**

i] Electrical Siren and Hand Operated Sirens shall be provided in office building/Emergency Control Room for warning the public as well as employees inside.

ii] The sound of electrical siren shall be audible upto 3 KMs.

iii] For fire condition Electrical Siren will be wailing for minimum 2 minutes and for all clear signal it will be a straight run siren for 2 minutes.

iv] For disaster condition the wailing sound shall be repeated with a minimum 10 seconds gap.

B] **Communication System**

For communication with officers/employees, intrinsically safe Walkie-Talkie is to be provided. For external communication, Telephone and Cell Phone facilities are to be provided.
8.9.4 Mutual Aid

It is not possible to combat large scale fire/disaster single handed effectively by any organization. Assistance of resources of fire fighting and other services are of utmost importance during the hour of crisis. Following type of mutual aids are envisaged:

i] Assistance by fire fighting teams & equipment.
ii] Medical and first aid assistance.
iii] Assistance of vehicles for any emergency requirement.
iv] Help in liaisoning with police, District Collectorate, Fire Brigade and Hospitals.

Mutual aid agreement should be done with nearby industries & facilities available in the area.

8.5 DISASTER CONTROL PLAN

The plan include three major plans –

i] Equipment Plan
ii] Organization Plan
iii] Action Plan

8.5.1 Equipment Planning

Equipment plan i.e. arrangement of fire fighting, safety, transport etc. has been discussed earlier.

8.5.2 Organization Plan

The disaster management organization and action plan is made in such a way that it is capable of quick response at any time to meet emergency situation. The plan gives a detailed chain of command, areas of responsibility of each personnel involved, information flow pattern and coordination activity required to meet the emergency. A typical Disaster Management Organization Chart is given below:
Organization Chart of Proposed Moinarband Depot

DEPOT MANAGER

SAFETY OFFICER  OPERATION OFFICER  ADMN. OFFICER  MAINTENANCE OFFICER

S & D OFFICER  FINANCE MANAGER

On Site Disaster Management Organization Moinarband Depot

CHIEF Emergency CONTROLLER

ADMINISTRATION & COMMUNICATION COORDINATOR  SAFETY COORDINATOR

SAFETY TEAM

NOTE: Organization Chart is as per OISD GDN-168

KEY PERSONNEL CHART
The senior most officers in the POL Depot is Depot manager, who will be the Chief Emergency Controller. In pre Emergency period he will delegate responsibility to other officers & other Coordinators as per suitability and the job to be done by them. During emergency, if Depot Manager is not present at site, the senior most officers in the Depot will assume the responsibility of Chief Emergency Controller and inform Depot Manager to be present at site at shortest possible time.

The duties and responsibilities of Chief Controller and other Coordinator are as follows:
DUTIES & RESPONSIBILITIES OF KEY PERSONS & COORDINATORS

Chief Emergency Controller

For On-Site Emergency Preparedness Plan (EPP), the Location-in-Charge (Depot Manager) shall be the Chief Emergency Controller to coordinate the execution of the plan during an emergency or a mock drill. He is responsible for preparation/updating of the plan, getting approval from the District authorities/Factory Inspectorate; and its implementation in the hour of need. His duties are -

a) Assess the magnitude of the situation and declare state of emergency. Activate EPP and ensure its implementation.
b) Mobilize the Coordinators/ Key Personnel and exercise direct operational control of areas, other than those affected.
c) Declare danger zones and activate Emergency Control Centre.
d) Ensure calling in Mutual aid members and District emergency agencies like Fire Brigade, Police, and Medical authorities.
e) Maintain a speculative continuous review of possible developments and assess these to determine most probable course of events and appropriate response.
f) Inform Area Office, Head Quarters, Police, Statutory authorities, District authorities about the magnitude of the emergency casualties and rescue operations.
g) Ensure casualties are receiving required attention and their relatives are informed.
h) Ensure accounting of personnel.
i) Issue authorized statements to Press, Radio, TV etc., regarding the emergency and its possible impact on the surroundings.
j) Authorize procurement of emergency material.
k) Log important developments in chronological order and preserve material evidence for investigation. Direct isolation of power supply, plant shutdown, and evacuation of personnel inside the premises as deemed necessary.
l) Advise Police, District authorities regarding evacuation of public in the nearby vicinity/ vulnerable zone. Ensure raising the siren in EMERGENCY mode till All Clear Signal.
m) When effects are likely to be felt outside, get in touch with District Authorities, who will take over the management and declare "Off-Site Emergency".

n) Control rehabilitation of affected areas on cessation of emergency.

Administration & Communication Coordinator

a) Liaise with Chief and other coordinators.

b) Inform and coordinate with External agencies and Mutual aid members for agreed assistance. Direct them on arrival to the respective coordinators.

c) In case communication means fail, send messengers to Mutual aid members/ Emergency departments. Coordinate with Police in controlling the traffic and mob outside the premises.

d) Activate the medical centre and mobilize medical team. Arrange ambulance and transfer casualties to hospitals. Also coordinate with police in case of fatalities.

e) Arrange for head count at the assembly points.

f) Arrange procurement of spares for fire fighting and additional medical drugs/ appliances.

g) Mobilize Transport as and when required by various coordinators. Arrange to provide spark arrestors to emergency vehicles entering the premises.

h) Monitor entry/exit of personnel in the premises. Permit only authorized personnel/ vehicles inside the premises.

i) Control and disperse crowd from the emergency site. Regulate traffic inside the location.

j) Arrange food, beverages and drinking water for all those involved in execution of EPP in case the emergency prolongs.

k) Communicate with relatives of casualties.

l) Arrange evacuation of premises as directed by Chief Emergency controller. Coordinate with civil authorities for evacuating public from the danger zone and arrange for refreshments at the evacuation center.
**Safety Coordinator**

a) Ensure safe stoppage of the Operations, switching off main instruments, shut off valves on product lines, and isolation of affected areas.

b) Demarcate Danger and Safe zones by putting **RED** and **GREEN** flags.

c) Mobilize the Fire fighting crew and direct the Fire Fighting operation.

d) Effectively deploy manpower, both internal and external.

e) Direct & utilize the Fire Brigade personnel.

f) Arrange the replacement of various Fire Fighting Squads with the Mutual and External aid members on need basis.

g) Ensure/ maintain sufficient pressure in the Hydrant mains.

h) Assess water level in the storage tanks/ reservoirs and plan replenishment.

i) Monitor the requirements of Fire equipment and coordinate for procurement of spares.

j) Arrange for flood lighting of the affected areas and dewatering of the Fire fighting areas, if required.

k) Arrange to remove and park the tank Lorries (Bulk & Packed) to a safer place, as necessary.

In case of any leakage of petroleum products or fire anybody witnessing the same should take immediate necessary action to stop leakage and extinguish fire with the help of fire extinguishers as well as inform Depot manager through Walkie- Talkie or through messenger or by shouting.

In case of any fire or explosion Depot In-charge takes charge of the situation and controls it with a well organized plan.

If any accident e.g. fire occurs during night, shift/security personnel shall attend it and in case of emergency Depot In-charge/DM and others shall be informed / called from their residence.

**8.5.3 Action Plan**

This gives guidelines to **PREVENT, CONTROL & TERMINATE ANY EMERGENCY** and consists of three parts.

a) Pre-emergency action

b) Action during emergency

c) Post emergency actions
Disaster Management Plan

**Pre-Emergency Actions**
These are essentially PRE-EMPTIVE AND PREVENTIVE measures and are extremely important. They include mock drills, checking of fire fighting facilities, keeping personal protective equipments in good condition in proper places, medical equipments, scheduled checking of safety devices, safety audits, preventive maintenance, good housekeeping, training of employees, education to the public and liaison with outside industries, State Fire Services, Police, district administration etc.

**Public Awareness**
In case of major accidents like large fire, explosion, effect of which may spread outside the plant boundary, people of the adjoining area may be panicky due to ignorance and may aggravate the problems. To avoid panic, the depot management will make easily understandable pamphlets in local language about the properties of petroleum products and actions to be taken by them during an Off-site Emergency. Training and education will also be imparted to the local public by audio-visual system with the help of local authorities. This will be done through Local Crisis Group consisting of District Administration.

**Mock Drills**
This is periodic simulation of emergency condition, sometimes in consultation with District Crisis Group/Local Crisis Group. The sequence of operation undertaken by Disaster Management Team members and systems provided like alarm & communication system, information flow pattern etc. are carefully put into operation by competent officials and the deficiencies/ problems are recorded. Based on this observation appropriate actions are taken to improve the efficiency of the plan.

**Training of Employees**
Regular training will be conducted to educate the employees about safety, fire fighting and Disaster Management. A selected number will be given intensive training in first aid, evacuation and rescue operation so that they can be utilized as a part of Disaster Control Team.
Disaster Management Plan

Liaison with Police, District Administration & State Fire Services & Neighbouring Industries
Help of Police and District Authorities are essential for off-site Emergency such as evacuation, transportation and treatment of individuals etc. In case of On-Site Emergency help of Police, District Administration, local hospitals and also fire services at Silchar district headquarter may be required depending on the severity of the situation.

PRE-EMERGENCY functions of Chief Emergency Controller are mainly
a) Ensure implementation of Emergency Planning
b) Ensure that all drafted for emergency are undergoing regular training.
c) Ensure all disciplines are fully prepared for tackling emergency.
d) Ensure that simulation of emergency condition is regularly arranged.
e) Ensure preventive and pre-emptive measures.
f) Keep liaison with outside agencies, police, district authorities etc.

Pre-Emergency functions of other Emergency Controller and their team are
a) Keep all the team members ready for tackling emergency.
b) Ensure that all members understand their specific duties during emergency.
c) Ensure regular participation of their team in mock drills.
d) Ensure supply of adequate number of safety & fire fighting equipment in proper place and in good working condition.

Actions during Emergency
Actions to be taken by Chief Emergency Controller and other Incident Controller have been discussed in the Organization Plan. In short the actions are:

a) Declare Emergency by electrical siren.
b) Instruct total/ partial shutdown.
c) Arrange the team for tackling emergency.
d) Ask for outside help, if necessary.
e) Keep liaison with outside agencies and provide authoritative information to news media and others.
Post Emergency Actions
These are directed towards termination of emergency, restoration of normalcy and rehabilitation.

It also includes identification of victims, information to their next of kin, notification to various government authorities, appointment of enquiry committee for identification of causes and suggestions to ensure that similar accident does not occur.

8.6 DISASTER COMBATING ACTION PLAN WITH SPECIFIC REFERENCE TO THE TEAM

As already stated, number of officers and staffs within plant are less and Depot Manager has to prepare the plan with available officers & staff members only.

A] DURING GENERAL SHIFT ON WORKING DAYS

(Chief Emergency Controller) : Depot Manager

ROLE
1] Take overall charge of the situation.
2] Rush to the spot where fire/ explosion has occurred. Issue instruction for speedy combating of the incident and preventing of damage to other areas.
3] Stop all operations locally/ shut down complete plant.
4] Declare emergency and operate electrical siren to inform employees, authorities and public.
5] Inform nearby factory authorities over phone and ask for assistance.
6] Inform local Fire Brigade.
7] Inform higher authorities and seek assistance for coordination of civil authorities, Fire Tenders from State/other agencies.
8] Inform Chief Inspectorate of Factories & Boilers.

B] FIRE COMBATING TEAM

In-charge : Depot Manager
Assisted By :
   i] Operation Officer (Fire)
   ii] Operator, TLF
   iii] Security Supervisor & Guards on duty.
Disaster Management Plan

**ROLE**

On hearing Fire Alarm –

1] Rush to the disaster spot and organize the team for combating fire as per direction of Chief Emergency Controller.

2] Security supervisor to ensure starting of Fire Engine and pressurization of fire hydrant.

3] Pump House Operator to stop all pumps and close all valves of the pumps as well tank body valves and join the team.

4] Operator of TLF section to stop loading/unloading operations, remove loading arm and unloading hose properly and join the combating team as per directions of Depot Manager.

Section In-Charge TLF to ensure the above and act for combating emergency as per direction of Chief Emergency Controller.

**C] EMERGENCY RESCUE TEAM**

In-charge : Depot Manager  
Assisted By : Security Guards on duty

**ROLE**

On hearing the Fire Alarm –

1] In-charge to organize the team with office staffs and other members as per direction of Chief Emergency Controller. If needed the In-charge should seek assistance of outside agencies.

2] Remove the injured from the spot after taking proper safety and personal protective appliances.

3] Arrange for First Aid of the injured and hospitalization, if necessary as per instruction of Chief Emergency Controller.

**D] EMERGENCY TEAM (TRANSPORT & SECURITY)**

In-charge : Depot Manager / Sr. Marketing Asst.  
Assisted By : Security Supervisor & Guards on duty

**ROLE**

1] Stop entry of all unauthorized personnel.

2] Arrange transportation for taking the injured personnel to hospital.
3] Seek assistance for vehicles/ambulance from outside agencies & hospitals nearby as per direction of Chief Emergency Controller.

E) FIRE DURING NIGHT TIME AND ON HOLIDAYS

In-charge : Depot Manager
Assisted by : Security supervisor on duty
            Security guards on duty
            Sr. Supervisor on duty

role

1] Security Guard on duty seeing the fire, will shout Fire! Fire!! and shall need assistance from other guards on duty in different pockets and shall fight the fire with nearest available fire equipments.

2] Immediately telephone to Moinarband Fire Brigade and Police Station at Moinarband for assistance.

3] Subsequently, Security Supervisor on duty will telephone to the residence of Depot Manager and Sr. Supervisor.

4] The Security Guards to control the gates and should ensure that no unauthorized person enter the premises.

8.7 ROLE ORDERS FOR DISASTER COMBATING ACTION PLAN

i] General Instructions

(a) The In-charge of the section/ sections (TLF)/ Administrative Office etc. affected shall ensure to take immediate action to isolate, close valves and mobilize enough equipment from nearby places.

(b) In-charge of stores shall keep the list of equipment available at various locations and coordinate with auxiliary team in-charge who mobilizes the materials.

(c) Safety Coordinator shall ensure replenishment of water to fire water tanks from bore-well and nearby other sources.

(d) After actions, Stores-in-charge to take inventory of all fire fighting items and to indent the shortfalls.

(e) All those moving towards scene of incident shall move with fire fighting equipment available.
ii] **Pump House**

Role Orders –

(a) Operator (Pump House) to stop all pumps.

(b) Close all valves including those of main tanks.

(c) Report combating team In-charge.

iii] **Administrative Block**

Role Orders –

(a) Section officers to ensure stop all loading operations.

(b) All T/Ts go out of TLF bays in orderly manner after closing T/T valves and manhole covers.

(c) Closing of all valves at TLF manifold.

(d) TLF officer to report to Fire Combating Team.

(e) Others to report to Safety Coordinator with available firefighting equipment.

iv] **Generator Room**

Role Orders –

(a) Operator to remain in Generator House for instructions from Chief Emergency Controller.

(b) To switch off unwanted electrical connections as instructed by Chief Emergency Controller.

v] **Stores**

Role Orders –

(a) In-charge to keep ready all fire fightings/first-aid/personal protective materials and arrange speedy disbursement to the combating crews.

(b) To issue materials as per demand.

(c) To liaise among in-charges.

(d) To make proper inventory of all items and shortfall to be identified as early as possible.
vi) Security Guards on Duty

Role Orders –

(a) To control the gate by allowing contract labourers to go out, ordering, moving out of vehicles as instructed by Chief Emergency Controller with valid document.

(b) To prevent unauthorized entry of outsiders.

(c) Security Guard posted at the main entrance gate to ensure proper control of traffic so that approach road is not blocked. Other security guards posted other than the gates, to report to their in-charge for further instruction.

8.8 ACTION PLAN FOR SPECIFIC CASES

(A) FIRE/EXPLOSION IN TLF SHED

Facilities: 12 nos. of Filling Bays with multi-product filling points.

Products handled: MS, SKO, HSD and ATF

Structure: Entire TLF structure is to be of elevated iron structures with proper roof, iron platforms and iron ladders.

HAZARD MINIMISER

(a) TLF in-charge with his officers and staff
(b) Fire Extinguishers
(c) Fire Hydrant Points
(d) Foam
(e) Water Jet
(f) Water Gel Blankets
(g) Alarm
(h) COMBATING AS PER DISASTER ORGANISATION CHART

SPECIAL REFERENCES

(a) Fire in filling shed should be attacked promptly with fire extinguishers.
(b) Close all valves promptly.
(c) Ensure orderly removal of TTs.
(d) Stop spreading over of fire and call for help.
(e) Put sand on small oil spills of fire to put off the fire by preventing source of O₂.
Disaster Management Plan

(f) Apply foam on burning oil on the floor. Apply foam gently so as not to scatter the burning oil and spread the fire. Apply foam from one side of the fire and with the foam blanket from that side across the oil pool. Remember that water destroys foam and water streams must not be turn on fire which is blanketed with foam.

(g) Apply water cooling to neighbouring TTs.

(h) Remove records/documents to safe place.

(i) When oil is burning under the truck and tank is not leaking, remove the truck away from fire, if possible or cover the oil with sand. Use water to cool the tank truck.

(j) Use foam or sand to fight fire around engine, raise the hood direct the stream of fluid at the base of fire.

(k) Use water or foam to fight fire in the cabin.

(l) Use water to fight fire on the tyres.

(m) Whenever the leak is seen in the bottom of tank, try to fill water into the tank so that oil level will be above the leak.

(n) In case of dome fire, close the dome cover immediately.

(B) FIRE IN TLF PUMP HOUSE

Facilities: Electric power/diesel engine driven pumps.

HAZARD MINIMISER

(a) Staff members assigned to the pump house

(b) Fire Extinguishers

(c) Fire Hydrant Points

(d) Foam

(e) Water Jet

(f) Water Gel Blankets

(g) Main Switches in the Switch Room

(h) Alarm

(i) Fire Resistant Asbestos Suit
ACTION PLAN AS PER DISASTER ORGANISATION CHART

Special References –

(a) Discharge DCP to prevent fire from spreading.
(b) Shut down the pumps by cutting off power supply.
(c) Remove any person who is working in the manifold.
(d) Close all tank lorry filling valves and manifold valves.
(e) Put foam on burning oil spills.
(f) Put foam on burning oil spills. Do not splash burning oil.
(g) Use DCP or CO₂ fire extinguisher on electrical fire.
(h) Cool the manifold with water.
(i) Wet down the structure close to the fire with water.
(j) When burning oil is running from the pump house or out of a broken connection in the manifold, check the flow or direct it to the points where it will not endanger structures and the surrounding properties.

(C) FIRE AT SMALL LEAK IN PIPELINE

1] Fire at a small leak in pipeline must be attacked promptly with the nearest fire extinguishers.
2] Shut off the flow of oil in the line by closing valves and by stopping pumping.
3] Cover the oil pool with sand and build up the sand so as to cover the leak.
4] Put foam on the burning oil pool.
5] Build earth dykes around the oil pool to prevent spreading of burning oil.
6] Take care of the oil dropping from the leak even after extinguishing fire as fire may occur again due to heating of oil dropped. Try to collect the same in containers.
7] Wet down the adjacent structures to keep them cool.

(D) BURSTING OF GASKET/LEAKAGE THROUGH JOINTS

1] Stop pumping.
2] Stop flow of oil through drain. Keep oil within limited area.
3] Close line valves.
Disaster Management Plan

4] Dig pits to collect oil.
5] Build earth dykes around the oil pool to prevent spreading of burning oil.
6] Take care of the oil dropping from the leak even after extinguishing fire as fire may occur again due to heating of oil dropped. Try to collect the oil in containers.
7] Wet down the adjacent structures to keep them cool.
8] Take action for replacement of gasket/repair leak with due care.

(E) FIRE IN ELECTRIC SUB-STATION/TRANSFORMER ROOM/SWITCH ROOM

Facilities: HT Switch, FUSE UNIT, GENSETS, PANEL, SWITCH ROOM, CONNECTION CABLES

HAZARD MINIMISERS
(a) Generator operators and other employees
(b) Fire extinguishers
(c) Sand buckets
(d) Main switches
(e) Alarm
(f) Earthing

ACTION PLAN AS PER DISASTER ORGANISATION CHART

Special Reference –
(a) Cut off power supply by switching off the mains
(b) Apply DCP/CO₂ extinguisher or dry sand.
(c) Call for outside help if required.
(d) Do not allow anybody to touch any electrical appliances.
(e) Take action to prevent spreading of fire.
(f) If fire is not extinguished, extinguish by spreading water with fog nozzle only after ensuring complete isolation of electrical supply.

(F) FIRE IN TANK FARM

Facilities: Storage Tank:

- MS Tanks : 3x1810 KL (FRVT)
- SKO Tanks : 2x3754 KL (CRVT)
- HSD Tanks: 4x3754 KL (CRVT)
- ATF Tanks : 3x938 KL (CRVT)
HAZARD MINIMISERS
(a) All employees particularly the employees of loading/receipt section
(b) Fire Extinguishers
(c) Fire Hydrant Points
(d) Foam
(e) Water Jet
(f) Water Sprinklers
(g) Asbestos Suit
(h) Alarm

DISASTER COMBATING PLAN: As per Disaster Organization Chart
Special Reference –
(a) A fire burning at the vent will not normally flash back into tank and explode if the tank contains product since flame arrestors are provided.
(b) Start cooling of tanks by using water sprinklers provided on tanks as well by wet jets.
(c) Close all valves since any removal of product will result in air being sucked inside, with the resultant flash back and explosion.
(d) Close manhole covers of other tanks if they are open. Also stop loading/receipt of oil in tank.
(e) Use foam to extinguish fire. Small fire can be handled with portable fire extinguishers.
(f) Call for help from outside agencies before fire is aggravated with the instruction of Chief Emergency Controller.

(G) FIRE IN TANK
(a) Fire in tank will normally burn quietly till the oxygen inside is consumed unless temperature of the product is allowed to increase uncontrolled. Hence, care must be taken to ensure that product temperature does not go high by cooling with water sprinklers and jets. This also avoids possibility of tank rupture due to hydrostatic Pressure.
(b) Care should be taken to ensure that the fire does not spread to other areas. If there is product spill to outside, foam should be used to cover the same.

(c) In such cases, foam should be pumped inside the tank for blanketing the fire simultaneously taking action to cool the tank shell with water and also removing the product by pumping it out to some other tank.

(d) Uncontrolled use of water on the burning product will result in product spill over and spread of fire. In the case of heavy ends this will result in boil over and frothing at the surface.

(e) When heavy ends like HSD burn, a layer of hot oil is formed below the surface, which extends towards the bottom. Temperature of this layer is of the order of 250°C to 300°C much above the boiling point of water. When water turns into steam, it expands approx. 1600 times and this results in boil over. The boil over may overflow the tank resulting in spreading of fire. Hence, in such of fire, cool down the tank by water sprinkler and also by continuous water jet on the tank shell, transfer the product to other tanks and judiciously use foam to smoothen fire.

(f) In case of F/R tanks, fires normally occur at F/R seals. Efforts should be made to put foam in the correct place simultaneously cooling the tank shell from outside.

(g) Do not waste foam by using it for cooling.

(h) Usage of water also should be in a controlled manner so that maximum benefit can be obtained.

(H) NATURAL CALAMITIES

(i) Heavy Rain

All structures/buildings in the depot have been designed to withstand heavy rain and hence not much of damage is anticipated.

Action Plan

(a) Switch off all industrial electrical connections.

(b) Ensure immediate closing of oil/water separator outlet (conventional) if any tank collapse happens.

(c) Inform Chief Emergency Controller.
Disaster Management Plan

(d) Keep constant touch with local authorities - District Magistrate and Police authorities.

(e) Stop all operations and do not resume it till clearance is given by Chief Emergency Controller.

(f) Bring all vehicles to a halt and ensure that hand brake is applied.

(g) Evacuate persons from damaged buildings/structures.

(h) Avoid going on top of high structures/ storage tanks.

(i) After the cyclone has struck, assess the situation and take necessary action as per the direction of Chief Emergency Controller.

(ii) **Lightening**

In the event of lightening strike, any of the following or all emergencies may occur:

(a) Fire in the tanks

*Action Plan*: Already described under the topic of tank fire.

(iii) **Earthquakes**

All buildings/ equipments are designed to withstand earthquakes and therefore, major disaster is not expected. However in case of an earthquake of much heavier scale may lead to –

(a) Fall of structures/ buildings

(b) Subsequent fire/ explosion

(c) Release of petroleum products

*Action Plan*: Already described under the topic of fire at various locations.

(I) **RIOTS/ SABOTAGE/ WAR**

*Action Plan*

(a) Close all gates.

(b) Maintain tight security.

(c) Chief Emergency Controller to keep contact with local authorities.

(d) Keep round the clock patrolling.
Disaster Management Plan

(e) Alert all employees of disaster control action plan and activate in case of requirement.

(J) SECURITY THREAT/ BOMB THREAT

Telephone Threat
When a bomb threat is received by telephone, the person receiving the call is to attempt as much information possible including
(a) All information about the device itself, including set time, type, description, location etc.
(b) Reasons for making call (angry with the company, extortion etc.)
(c) Any information about the caller (apparent age, voice characteristics, speech, language, accent, manner and use of unusual terms).
(d) Any information of the location of the caller (inside or outside a building, background noise etc.)

The person then contacts the Depot In charge/ Safety Officer.

Depot In charge’s Responsibility:
The depot in charge will contact the police department immediately. The police will advice on the next course of action. Possible actions may include
(a) Inform operation officers but do not search or evacuate.
(b) Initiate search but do not evacuate.
(c) Evacuate specific area and search.
(d) Search and then full evacuation immediately prior to target time.
(e) Immediate evacuation

Searches are to be conducted by police with assistance of department personnel who are most able to spot “pit of place” items. Only bomb squad personnel are to handle suspected device.

Emergency Brigade:
The emergency brigade is to be on standby to facilitate immediate response to an actual emergency (fire, explosion etc.)
Disaster Management Plan

Emergency Actions:
(a) The persons inside the plant except emergency brigade should be evacuated.
(b) All vehicles in the plant premises should be evacuated to safer places.
(c) Any new or doubtful object should not be touched.
(d) All pipelines and tank valves should be closed and all operations inside the plant should be stopped.
(e) In case of fire, city fire brigade at Moinarband should be called.
(f) If during searching, a bomb is found it should be defused by bomb squad immediately.

8.9 IMPORTANT TELEPHONE NUMBERS

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Designation</th>
<th>Phone No. / Mobile No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>District Collector</td>
<td>03842 – 245056, 261054</td>
</tr>
<tr>
<td>2.</td>
<td>Police Station,</td>
<td>03842 – 245866, 231436, 245057</td>
</tr>
<tr>
<td>3.</td>
<td>Fire Brigade</td>
<td>03842 – 245801</td>
</tr>
<tr>
<td>4.</td>
<td>Civil Hospital</td>
<td>03842 – 245735</td>
</tr>
<tr>
<td>5.</td>
<td>Medical college</td>
<td>03842 – 229110</td>
</tr>
</tbody>
</table>

Fire Station at Moinarband
Hospitals at Moinarband