Crisis Management Group (CMG) consisting of highly skilled & decision making persons will be identified within the organization to tackle with such extreme situations.

7.3.2.9 Measures during Drilling and Blasting

Following measures will be taken while drilling and blasting operations in the quarry:

- Drilling and blasting in quarry will be done in accordance with the provisions of the Mines Act, rules and regulations;
- Adequate safety measures will be taken during blasting operations in the quarry so that men/machines are not affected;
- Ground vibration due to blasting will be controlled by the following measures:

  1. Reducing the explosive charge per delay;
  2. Reducing the spacing and burden per blast;
  3. Reducing the amount of explosive charged per blast; and
  4. Proper controlled rock movement during blast by using suitable initiating sequence and delay.

7.4 Risk Assessment and Disaster Management Plan

Hazard analysis involves the identification and quantification of various hazards (unsafe conditions) that exist in the mines. On the other hand, risk analysis deals with the identification and quantification of risks, the plant and mining equipment and personnel are exposed to, due to accidents resulting from the hazards present in the mine.

Risk analysis follows an extensive hazard analysis. It involves the identification and assessment of risks the neighboring populations are exposed to as a result of hazards present. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of populations etc. Much of this information is difficult to get or generate. Consequently, the risk analysis is often confined to maximum credible accident studies.
In the sections below, the identification of various hazards, probable risks in the mines, maximum credible accident analysis, and consequence analysis are addressed which gives a broad identification of risks involved in the proposed expansion of mining project. Based on the risk estimation disaster management plan has been also been presented.

7.4.1  Approach to the Study

Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas;
- Identification of representative failure cases;
- Visualization of the resulting scenarios in terms of fire (thermal radiation) and explosion;
- Assess the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios;
- Assess the overall suitability of the site from hazard minimization and disaster mitigation point of view;
- Furnish specific recommendations on the minimization of the worst accident possibilities; and
- Preparation of broad DMP, On-site and Off-site Emergency Plan, which includes Occupational Health and Safety Plan.

The complete mining will be carried out under the management control and direction of a qualified mine manager holding a first class manager’s certificate of competency. The DGMS has been regularly issuing standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff will be sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation:

- Accident due to explosives;
- Accident due to heavy mining equipment; and
- Sabotage in case of magazine.
In order to take care of above hazard/disasters, the following control measures will be adopted.

- All safety precautions and provisions of the Mine Act, 1955, the Coal Mines Regulation, 1957 and the Mines Rules, 1955 will be strictly followed during all mining operations;
- Entry of unauthorized persons will be prohibited;
- Fire fighting and first-aid provisions in the mines office complex and mining area;
- Provisions of all the safety appliances such as safety boot, helmets, goggles etc. will be made available to the employees and regular check for their use;
- Training and refresher courses for all the employees working in hazardous premises; Under mines rules all employees of mines will have to undergo the training at a regular interval;
- Working of mine, as per approved plans and regularly updating the mine plans;
- Cleaning of mine faces will be regularly done;
- Handling of explosives, charging and blasting will be carried out by competent persons only;
- Provision of magazine at a safe place with fencing and necessary security arrangement;
- Regular maintenance and testing of all mining equipment as per manufacturer’s guidelines;
- Suppression of dust on the haulage roads;
- Adequate safety equipment will be provided at explosive magazine; and
- Increasing the awareness of safety and disaster through competitions, posters and other similar drives.

For any type of above disaster, a rescue team will be formed by training the mining staff with specialized training.

7.4.2 Possible Hazards in Opencast Coal Mines
There are various factors, which can cause disaster in the mine. The mining activity has several disaster prone areas. The identification of various hazards is shown in Figure-7.3 and the hazards are discussed below.

7.4.2.1 Blasting

Most of the accidents from blasting occur due to the projectiles, as they may some times go even beyond the danger zone, mainly due to overcharging of the shot-holes as a result of certain special features of the local ground. Flying rocks are encountered during initial and final blasting operations. Vibrations also lead to displacement of adjoining areas. Dust and noise are also problems commonly encountered during blasting operations.

7.4.2.2 Overburden

The overburden dump may cause landslides. High overburden dump created at the quarry edge may cause sliding of the overburden dump or may cause failure of the pit slope due to excessive loading, thereby causing loss of life and property.

7.4.2.3 Heavy Machinery

Most of the accidents during transport of dumpers, trucks, proclains and ripper dozers and other heavy vehicles are often attributable to mechanical failures and human errors.

7.4.2.4 Storage of Explosives

The explosive magazine with storage facility is proposed for 3 Tonne of high explosives, 1000 no of detonators, 15000 m of detonating cord, 10 Tons of Ammonium Nitrate. For the purpose of transportation of explosives, explosive van is proposed.
FIGURE-7.3: IDENTIFICATION OF HAZARDS IN OPENCAST MINE
The main hazard associated with the storage, transport and handling of explosives is fire and explosion. The rules as per the Indian Explosives Act and Rules 1883 should be followed for handling of explosives, which includes transportation, storage and use of explosives.

7.4.2.5 Fuel Storage

Most of the HEMM is operated on diesel. Hence, a licensed diesel storage facility from IOC and disbursing units of appropriate capacity has also been provided.

7.4.2.6 Water Logging

Water logging in the mine site can be avoided by adopting following measures:

- Position of water body should be correctly known; and
- Draining of mine water by suitable capacity pumps.

7.4.2.7 Hazard Identification

Classification of Major Hazardous Substance

Hazardous substances may be classified into three main classes: flammable substances, unstable substances and toxic substances. The ratings for a large number of chemicals based on flammability, reactivity and toxicity have been given in NFPA Codes 49 and 345 M. The details of the fuel storages in the mine are given in Table-7.8. Hazardous characteristics of the major flammable materials and chemicals that are employed in different processes are listed in Table-7.9.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Product</th>
<th>No. of Tanks</th>
<th>Classification</th>
<th>Design Capacity (KL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSD</td>
<td>1</td>
<td>B</td>
<td>50</td>
</tr>
</tbody>
</table>

A: Dangerous Petroleum     B: Non-Dangerous Petroleum     C: Heavy Petroleum

Source: Mine Plan
TABLE - 7.9 : PROPERTIES OF FUELS/CHEMICALS USED AT THE COAL MINE

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Codes/Label</th>
<th>TLV</th>
<th>FBP</th>
<th>MP</th>
<th>FP</th>
<th>UEL</th>
<th>LEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSD</td>
<td>Flammable liquid</td>
<td>Not Listed</td>
<td>360</td>
<td>--</td>
<td>32</td>
<td>5.0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source : IOCL/MSDS Sheets

- **Identification of Major Hazard Installations Based on GOI Rules, 1989 (Amended in 2000)**

A systematic analysis of the fuels and their quantities of storage has been carried out, to determine threshold quantities as notified by GOI Rules and the applicable rules are identified. The results are summarized in Table-7.10.

TABLE - 7.10 : APPLICABILITY OF GOI RULES TO FUEL/CHEMICAL STORAGE

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Chemical/Fuel</th>
<th>Listed in Schedule</th>
<th>Total Quantity (KL)</th>
<th>Threshold Quantity (T) for Application of Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSD</td>
<td>3(1)</td>
<td>1 X 50</td>
<td>5,7-9,13-15 10-12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25 MT 200 MT</td>
</tr>
</tbody>
</table>

Source : Mine Plan & Material Safety Data Sheets

- **Fire Explosion and Toxicity Index (FE&TI) Approach**

Based on the GOI Rules, the hazardous fuels used in the proposed mine are identified. Fire and Explosion are the likely hazards, which may occur due to the fuel storages. Hence, Fire and Explosion index has been calculated for storage in mine. Detailed estimates of FE&TI are given in Table-7.11.
Environmental Impact Assessment for the Proposed expansion of Surkha (North) Lignite Mine project (3 MTPA to 5 MTPA in ML area of 3672 ha) located at Tehsil Ghogha, District Bhavnagar, Gujarat

Chapter-7 Additional Studies

TABLE-7.11: FIRE EXPLOSION AND TOXICITY INDEX FOR STORAGE FACILITIES

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Chemical</th>
<th>Total Quantity</th>
<th>F&amp;EI</th>
<th>Category</th>
<th>TI</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HSD</td>
<td>1 X 50 KL</td>
<td>8.1</td>
<td>Light</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Source: Mine Plan & Material Safety Data Sheets*

➢ **Safety Measures at the Mine site**

- Adequate care has been taken in deciding the size of the bench for the working as well as ultimate pit.
- The benches are properly sloped at an angle of 70 degree to avoid any spillage of benches.
- Adequate drainage system at the top of the pit and also on the benches shall be made to prevent erosion of the benches.
- The quarries will be protected by garland drains around the periphery for storm water drainage.
- A minimum safe distance of 100-m will be kept between the surface edge of the quarry and the nearest public building, roads etc. When the surface edge of the quarry approaches within a limit of 300 m from any road, public building special permission from DGMS will be taken to conduct controlled blasting to prevent damage/injury to public life and property; and
- All mining operations both within the quarry and outside will be conducted as per the conditions laid down by DGMS and under the strict supervision of competent persons appointed under the Coal Mines Regulations, 1957.

➢ **Precautionary Measures to Avoid Accidents Due to Blasting:**

- The provisions laid down in the Coal Mine Regulation, 1957 related to Blasting shall strictly be followed. However some of the main provisions are written here-
- Shots shall not be fired except during the hours of daylight. The holes charged on any particular day shall be fired on the same day.
- Adequate blasting shelters or other protection shall be provided at mines.
• The shot-firer shall give sufficient warning by effective signals over the entire area falling within a radius of danger zone.
• Multi-shot exploder shall be used. A shot-firer will fire maximum 120 Shots.
• During the approach and progress of electrical storm, adequate precautions shall be taken.
• The charge in the hole shall be so decided & delay should be provided in such a way that the Peak Particle Velocity (PPV) do not exceed the Threshold Limit.

➢ Precautionary Measures to Prevent the Overburden Dump Failures:

• A study stone wall should be built around the toe of each inactive dump at a distance of about 50 m from the toe.
• To prevent the failure of overburden slopes, especially during rainy season, following precautions need to be taken against this hazard:
  a. Proper terracing of the dump slope, with maximum bench height of 10 m.
  b. Adequate drainage system to be provided in each lift of the dump to prevent erosion of the dump sides.
• Planting vegetation as early as possible over the overburden dump slopes.
• The drainage channels along the overburden dump toes provide additional protection.
• While doing this, a distance of over 15 m should be left between the overburden dump and the toe drain.

➢ Precautionary Measures to Prevent Accidents due to Trucks and Dumpers:

• All transportation within the main working shall be carried out directly under the supervision and control of the management.
• The vehicles must be maintained in good repairs and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management.
• Road signs shall be provided at each and every turning point especially for the
guidance of the drivers at the night.
• To avoid danger while reversing the trackless vehicles especially at the embankment
and tipping points, all areas for reversing of lorries should as far as possible be made
man free.
• A statutory provision of the fences, constant education, training etc. will go a long
way in reducing the incidents of such accidents.
• Generally, oversize rocks shall be dealt with in the pit by secondary blasting.
However, for haul trucks at the dump with such oversize materials, the following
recommendations are given.
  a. Load consisting of large rocks must not be over the edge. This is unsafe and may
damage equipment.
  b. Such load must be inside.
• Dumping of overburden or waste material by dumpers and dozers will be governed
by Code of Dumping, which is already formulated & implemented.
• The movement of the dumpers will be governed under the Code of Traffic rule which
is already formulated & implemented.

7.4.3 Disaster Management Plan

The disaster management plan is aimed to ensure safety of life, protection of environment,
protection of installation, restoration of production and salvage operations in this same
order of priorities. For effective implementation of the disaster management plan, it should
be widely circulated and personnel training through rehearsals/drills. The objective of the
disaster management plan is to make use of the combined resources of the mine and cola
washery the outside services to achieve the following:

1. Effect the rescue and medical treatment of casualties;
2. Safeguard other people;
3. Minimize damage to property and the environment;
4. Initially contain and ultimately bring the incident under control;
5. Identify any dead;
6. Provide for the needs of relatives;
7. Provide authoritative information to the news media;
8. Secure the safe rehabilitation of affected area; and
9. Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

➢ Emergency Organization (EO)

It is recommended to setup an emergency organization. A senior executive (Mine Manager) who has control over the affairs of the mine would be heading the emergency organization. He would be designated as site controller. As per the general organization chart, in the mines, the mines manager would be designated as the Incident Controller (IC). The incident controller would be reporting to the site controller.

Each incident controller, for himself, organizes a team responsible for controlling the incidence with the personnel under his control. Shift In-charge would be the reporting officer, who would bring the incidence to the notice of the incidence controller and site controller.

Emergency co-ordinators would be appointed who would undertake the responsibilities like fire fighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, Security in-charge, personnel department, essential services personnel would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, electrical fitters, pump house in-charge and other maintenance staff would be drafted for emergency operations. In the event of power or communication system failure, some of staff members in the mine offices would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.
• **Emergency Communication (EC)**

Whoever notices an emergency situation such as fire, growth of fire etc. would inform his immediate superior and Emergency Control Centre (ECC). The person on duty in the emergency control centre would appraise the site controller. Site Controller verifies the situation from the incident controller of that area or the Shift In-charge and takes a decision about an impending on site emergency. This would be communicated to the entire incident controllers, emergency co-ordinators. Simultaneously, the emergency warning system would be activated on the instructions of the site controller.

• **Emergency Responsibilities**

The responsibilities of the key personnel are appended below:

• **Site Controller**

On receiving information about emergency he would rush to emergency control centre and take charge of ECC and the situations which all are given below:

- Assesses the magnitude of the situation on the advice of incident controller and decides;
- Whether the affected area needs to be evacuated;
- Whether personnel who are at assembly points need to be evacuated;
- Declares Emergency and orders for operation of emergency siren;
- Organizes announcement by public address system about location of emergency;
- Assesses which areas are likely to be affected, or need to be evacuated or are to be alerted;
- Maintains a continuous review of possible development and assesses the situation in consultation with Incident Controller and other Key Personnel as to whether shutting the mine operation required and if evacuation of persons is required;
- Directs personnel for Rescue, rehabilitation, transport, fire, brigade, medical and other designated mutual support systems locally available, for meeting emergencies;
Environmental Impact Assessment for the Proposed expansion of Sorkha (North) Lignite Mine project (3 MTPA to 5 MTPA in ML area of 3672 ha) located at Tehsil Ghogha, District Bhavnagar, Gujarat

Chapter-7
Additional Studies

- Controls evacuation of affected areas, if the situation is likely to go out of control or effects are likely to go beyond the mine boundary, informs to District Emergency Authority, Police, Hospital and seeks their intervention and help;
- Informs the statutory authorities;
- Gives a public statement if necessary;
- Keeps record of chronological events and prepares an investigation report and preserves evidence; and
- On completion of On Site Emergency and restoration of normalcy, declares all clear and orders for all clear warning.

- **Incident Controller**

- Assembles the incident control team;
- Directs operations within the affected areas with the priorities for safety to personnel, minimize damage to property and environment and minimize the loss of materials;
- Directs the shutting down the operations and areas likely to be adversely affected by the emergency;
- Ensures that all key personnel help is sought;
- Provides advise and information to the Fire and Security Officer and the Local Fire Services as and when they arrive;
- Ensures that all non-essential workers/staff of the affected areas evacuated to the appropriate assembly points, and the areas are searched for causalities;
- Has regard to the need for preservation of evidence so as to facilitate any inquiry into the cause and circumstances which caused or escalated the emergency;
- Co-ordinates with emergency services at the site;
- Provides tools and safety equipment to the team members;
- Keeps in touch with the team and advise them regarding the method of control to be used; and
- Keeps the Site Controller of Emergency informed of the progress being made.
• **Emergency Coordinator - Rescue, Fire Fighting**

- On knowing about emergency, rushes to ECC;
- Helps the incident Controller in containment of the emergency;
- Ensure fire pumps in operating conditions and instructs pump house operator to ready for any emergency with standby arrangement;
- Guides the fire fighting crew i.e. firemen, trained mine personnel and security staff;
- Organizes shifting the fire fighting facilities to the emergency site, if required;
- Takes guidance of the Incident Controller for fire fighting as well as assesses the requirements of outside help;
- Arranges to control the traffic at the incident area;
- Directs the security staff to the incident site to take part in the emergency operations under his guidance and supervision;
- Evacuates the people in the mine or in the nearby areas as advised by Site Controller;
- Searches for casualties and arranges proper aid for them;
- Assembles search and evacuation team;
- Arranges for safety equipment for the members of this team;
- Decides which paths the evacuated workers should follow; and
- Maintains law and order in the area, and if necessary seeks the help of police.

• **Emergency Coordinator - Medical, Mutual Aid, Rehabilitation, Transport and Communication**

In the event of failure of electric supply and thereby internal telephone, sets up communication point and establishes contact with the Emergency Control Centre (ECC).

- Organizes medical treatment to the injured and if necessary will shift the injured to nearby hospitals;
- Mobilizes extra medical help from outside, if necessary;
- Keeps a list of qualified first aiders of the factory and seek their assistance;
- Maintains first aid and medical emergency requirements;
- Makes sure that all safety equipment are made available to the emergency team;
• Assists Site Controller with necessary data and to coordinate the emergency activities;
• Assists Site Controller in updating emergency plan, organizing mock drills verification of inventory of emergency facilities and furnishing report to Site Controller;
• Maintains liaison with Civil Administration;
• Ensure availability of canteen facilities and maintenance of rehabilitation centre;
• Liaison with Site Controller/Incident Controller;
• Ensure transportation facility;
• Ensures availability of necessary cash for rescue/rehabilitation and emergency expenditure;
• Controls rehabilitation of affected areas on discontinuation of emergency; and
• Makes available diesel/petrol for transport vehicles engaged in emergency operation.

• Emergency Coordinator - Essential Services

• He would assist Site Controller and Incident Controller;
• Maintains essential services like Diesel Generator, Water, Fire Water, power supply for lighting;
• Gives necessary instructions regarding emergency electrical supply, isolation of certain sections etc. to shift in-charge and electricians; and
• Ensures availability of adequate quantities of protective equipment and other emergency materials, spares etc.

• General Responsibilities of Employees during an Emergency

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the workers in-charge, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.
7.4.4 Emergency Facilities

- **Emergency Control Centre (ECC)**

For the time being, Mine Office Block is identified as Emergency Control Centre. It would have external Telephone, Fax, Telex facility. All the Site Controller/ Incident Controller Officers, Senior Personnel would be located here. Also, it would be an elevated place.

The following information and equipment are to be provided at the Emergency Control Centre (ECC):

- Intercom, telephone;
- P & T telephone;
- Safe contained breathing apparatus;
- Fire suit / gas tight goggles / gloves / helmets;
- Hand tools, wind direction/velocities indications;
- Public address megaphone, hand bell, telephone directories;
- Internal P & T, factory layout, site plan;
- Emergency lamp/torch light/batteries;
- Plan indicating locations of hazard inventories, sources of safety equipment, work road plan, assembly points, rescue location vulnerable zones, escape routes;
- Hazard chart;
- Emergency shut-down procedures;
- Nominal roll of employees;
- List of key personnel, list of essential employees, list of Emergency Co-ordinators;
- Duties of key personnel;
- Address with telephone numbers and key personnel, emergency coordinator, essential employees; and
- Important address and telephone numbers including Government agencies, neighboring industries and sources of help, out side experts, population details around the Mine.
• **Assembly Point**

3 Numbers of assembly points are already provided wherein employees who are not directly connected with the disaster management would be assembled for safety and rescue. Emergency breathing apparatus, minimum facilities like water etc. would be organized.

In view of the size of mine pit area, different locations should be ear marked as assembly points. Depending upon the location of hazard, the assembly points are to be used.

• **Emergency Power Supply**

Mine facilities are connected to power supply from the GSEB. In the event of any grid supply failure, Diesel Generators are provided at the mine, which is operated as soon as any power failure occurs. Thus water pumps, mine lighting and emergency control centre, administrative building and other auxiliary services are connected to emergency power supply. In all the blocks flame proof type emergency lamps would be provided.

• **Fire Fighting Facilities**

First aid fire fighting equipment suitable for emergency are being maintained in each operation areas of the mine as per statutory requirements.

• **Location of Wind Sock**

On the top of the administration block, windsock is installed to indicate direction of wind for emergency escape.

• **Emergency Medical Facilities**

Stretchers, gas masks and general first aid materials for dealing with chemical burns, fire burns etc. are being maintained in the medical centre as well as in the emergency control room. Private medical practitioners help is being sought during emergencies. Government hospital would be approached for emergency help.
Names of medical personnel, medical facilities in the area are prepared and displayed. Necessary specific medicines for emergency treatment of burns patients and for those affected by toxicity would be maintained.

Breathing apparatus and other emergency medical equipment are provided and maintained. The help of nearby industrial management’s in this regard would taken on mutual support basis.

- **Ambulance**

An ambulance with driver availability in all the shifts, emergency shift vehicle is ensured and maintained to transport injured or affected persons. Number of persons are trained in first aid so that, in every shift first aid personnel would be available.

7.4.5 **Emergency Actions**

- **Emergency Warning**

Communication of emergency is made familiar to the personnel inside the mine and people outside. An emergency warning system is also established.

- **Evacuation of Personnel**

In the event of an emergency, unconnected personnel have to escape to assembly point. Operators have to take emergency shutdown procedure and escape. Time Office maintains a copy of deployment of employees in each shift. If necessary, persons can be evacuated by rescue teams.

- **All Clear Signal**

Also, at the end of an emergency, after discussing with Incident Controllers and Emergency Co-ordinators, the Site Controller orders an all clear signal. When it becomes essential, the site controller communicates to the district emergency authority, police and fire service personnel regarding help required or development of the situation into an Off-Site Emergency.
7.4.6 General

- **Employee Information**

During an emergency, employees are warned by raising siren in specific pattern. Employees are provided with information related to fire hazards, antidotes and first aid measures. Those who would designate as key personnel and essential employees should be given training to emergency response.

- **Co-ordination with Local Authorities**

Keeping in view of the nature of emergency, two levels of coordination are practiced. In the case of an On Site Emergency, resources within the organization would be mobilized and in the event extreme emergency local authorities help should be sought.

In the event of an emergency developing into an off site emergency, local authority and District emergency Authority (normally the Collector) would be appraised and under his supervision, the Off Site Disaster Management Plan would be exercised. For this purpose, the facilities that are available locally, i.e. medical, transport, personnel, rescue accommodation, voluntary organizations etc. would be mustered. Necessary rehearsals and training in the form of mock drills should be organized.

- **Mutual Aid**

Mutual aid in the form of technical personnel, runners, helpers, special protective equipment, transport vehicles, communication facility etc. should be sought from the neighboring industrial management's.

- **Mock Drills**

Emergency preparedness is an important aspect of planning in Industrial Disaster Management. Personnel's trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel should be trained in the operations.
**Important Information**

Important information such names and addresses of key personnel, essential employees, medical personnel, transporters address, address of those connected with Off Site Emergency such as Police, Local Authorities, Fire Services, District Emergency Authority are prepared and maintained.

### 7.4.7 Off-Site Emergency Preparedness Plan

The task of preparing the off-site emergency plan lies with the district collector. However, the off-site plan will be prepared with the help of the local district authorities. The proposed plan will be based on the following guidelines.

**Aspects Proposed to be Considered in the Off-Site Emergency Plan**

The main aspects which should be included in the emergency plan are:

- **Organization**

  Details of command structure, warning systems, implementation procedures, emergency control centres, names and appointments of incident controller, site main controller, their deputies and other key personnel.

- **Communications**

  Identification of personnel involved, communication centre, call signs, network, lists of telephone numbers.

- **Specialized Knowledge**

  Details of specialist bodies, firms and people upon whom it may be necessary to call e.g. those with specialized knowledge of fire control.
• **Voluntary Organizations**

Details of organizers, telephone numbers, resources etc.

• **Chemical Information**

Details of the hazardous substances stored or procedure on each site and a summary of the risk associated with them.

• **Meteorological Information**

Arrangements for obtaining details of whether conditions prevailing at the time and whether forecasts.

• **Humanitarian Arrangements**

Transport, evacuation centres, emergency feeding treatment of injured, first aid, ambulances, temporary mortuaries.

• **Public Information**

Arrangements for dealing with the media press office; b) informing relatives, etc.

• **Assessment**

Arrangements for: (a) collecting information on the causes of the emergency; (b) reviewing the efficiency and effectiveness of all aspects of the emergency plan.

• **Role of the Emergency Co-ordinating Officer**

The various emergency services should be co-ordinated by an emergency co-ordinating officer (ECO), who will be designated by the district collector. The ECO should liaise closely with the site main controller. The ECO should inform the DGMS authorities in case of accidents as per the statutory requirement. Again depending on local arrangements, for very severe incidents/accidents with major or prolonged off-site consequences, the
External control should be passed to a senior local authority administrator or even an administrator appointed by the central or state government.

- **Role of the Local Authority**

The duty to prepare the off-site plan lies with the local authorities. The emergency planning officer (EPO) appointed should carry out his duty in preparing for a whole range of different emergencies within the local authority area. The EPO should liaise with the works, to obtain the information to provide the basis for the plan. This liaison should ensure that the plan is continually kept up to date.

It will be the responsibility of the EPO to ensure that all those organizations which will be involved off site in handling the emergency, know of their role and are able to accept it by having for example, sufficient staff and appropriate equipment to cover their particular responsibilities. Rehearsals for off-site plans should be organized by the EPO.

- **Role of Police**

Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. Their functions should include controlling bystanders evacuating the public, identifying the dead and dealing with casualties, and informing relatives of death or injury.

- **Role of Fire Authorities**

The control of a fire should be normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the site incident controller on arrival at the site. The senior fire brigade officer should also have a similar responsibility for other events, such as explosions. Fire authorities in the region should be apprised about the location of all stores of flammable materials, water supply points and fire-fighting equipment. They should be involved in on-site emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.
• **Role of Health Authorities**

Health authorities, including doctors, surgeons, hospitals, ambulances, and so on, should have a vital part to play following a major accident, and they should form an integral part of the emergency plan.

For major fires, injuries should be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in all but extreme cases may be generally available in most hospitals.

Major off-site incidents are likely to require medical equipment and facilities additional to those available locally, and a medical “mutual aid” scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

• **Role of Government Safety Authority**

This will be the factory inspectorate available in the region. Inspectors are likely to want to satisfy themselves that the organization responsible for producing the off-site plan has made adequate arrangements for handling emergencies of all types including major emergencies. They may wish to see well documented procedures and evidence of exercise undertaken to test the plan.

In the event of an accident, local arrangements regarding the role of the factory inspector will apply. These may vary from keeping a watching brief to a close involvement in advising on operations in case involvement in advising on operations.

### 7.5 Corporate Social Responsibility (CSR)

All developmental works needs to be carried out keeping in mind the potential needs of the local people of the area. Under all circumstances, the needs (economic, social and cultural) of the local people have to be properly and adequately addressed.

Socio-economic profile of the study area revealed that mining and associated sector would be major source of employment. Local people would be benefited by increase in