

Risk Assessment & DMP

7.1 Risk Assessment

Any industrial activity involving any Hazardous Chemical (HC) named or classified in the various schedules under the Environment (Protection) Act, 1986/Hazardous Waste (Management and Handling) Rules 1989 (as amended in 2000) attracts compliance with the rules. Section 41B(4) of the Factories Act, 1948 (as amended) also states that every Occupier is to draw up an Onsite Emergency Plan with detailed disaster control measures. Accordingly, a Disaster Management Plan (DMP) has been prepared for the Alathiyur Cement Plant Complex and the **System is in place** to tackle any event of disaster.

The major elements of the Risk Assessment include :

- ❖ Hazard & Operability (HAZOP) Studies for identification of hazards and vulnerable sections of the storage.
- ❖ Consequence Analysis for various release scenarios.
- ❖ Presentation of damage contour for worst damage from fire or explosion.
- ❖ Risk Assessment and
- ❖ Provision of guidelines for emergency preparedness based on the findings.

The study includes :

1. Hazard Identification and Visualisation of Credible Accident Scenarios :

- ❖ Study of Plant Layouts and Process involved in the Hazardous Materials storage and handling.
- ❖ The inventory of stored materials.
- ❖ Identification of hazards.
- ❖ Analysis of past accident data to develop the credibility of worst accident scenarios and
- ❖ Visualization of Credible Accident scenarios (CAS).

2. Analysis of CAS

Analysis of identified CAS and quantification of effects pertaining to the cases of :

- ❖ Outflow and releases
- ❖ Heat radiation
- ❖ Explosion
- ❖ Application of damage criteria for heat radiation and explosion.
- ❖ Presentation of damage contours for worst damages from fire or explosion.
- ❖ Effect of the proposed project on neighboring areas (including cascade effects if any).

3. Risk Assessment based on the individual Risk Contour Plots and

4. Emergency Preparedness Plan and other safety recommendations based on the studies.

7.2 Disaster Management Plan

Disasters are off natural as well as man-made. **Natural Disasters** include Earthquakes, Floods, River Erosion, Cyclones, Tsunami, Landslides, Fires, etc. and the **Man Made Disasters** include Nuclear, Chemical, Mines, Biological, Cyber Terrorism, Environmental Disasters, etc. In order to better protect the Factory from any hazards, proactive approach has been applied in all operations of disaster preparedness, prevention and mitigation. To deal with an emergency, the arrangement for immediate deployment or appointment of key personnel and their specific duties are brought out.

Emergency Preparedness and Response - Plant

A. The following areas are identified as potential emergency areas.

S. No	LOCATION	Fire	Fatal accident	Env emergency	Food poison
I	Gas Cylinders Storage Areas				-
II	Fabrication / Erection / Civil Construction works			-	-
III	DG Set		-	-	-
IV	FO / Diesel / Pyrolysis oil Storage area				-
V	Boilers				-
VI	TG Power Plant				-
VII	Coal / other solid fuel storage & conveying				-
VIII	Main Electrical Sub-Station With Switch Yard			-	-
IX	MCCs, PCCs & HT Panels			-	-
X	ESPs				-
XI	Bag houses / RABH / bag filters				-
XII	Bags godown				-
XIII	Cyclone jamming				-
XIV	Lubricants Storage area				-
XV	Air Receiver Tanks				-
XVI	All Office area / Lab / CCR		-	-	-
XVII	Acid/ Base storage and handling	-			-
XVIII	Stores		-		-
XIX	Canteen / Mess / Guest House / Food preparation		-	-	
XX	Snake bite	-		-	-

All these potential emergency areas are declared as No Smoking Zones .

I. GAS CYLINDERS STORAGE AREAS:

Locations: Stores
Limestone Crusher
Auto Garage

Control Measures provided:

- Suitable fire extinguishers and fire buckets are provided near the storage.
- No electrical fittings are provided.
- Individual variety of gas cylinders are kept in designated locations. Empty cylinders are kept separately.
- While unloading the gas cylinders, it is checked for safety cap / guard for the cylinders
- Gas cylinders are kept vertically and properly latched individually.
- Housekeeping is maintained well

In case of Emergency:

- Any person noticing any sort of fire at this storage immediately informs the main gate security at phone No. 100 and give details of the incident, the exact location and if possible its magnitude.
- In case of leakage of gas cylinder, the cylinder is isolated (if possible) to the safe location and allows cylinder in that condition till the gas gets exhausted.

- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location.
- Move cylinders from fire area, without risk. Otherwise, keep cooling streams of water on fire-exposed cylinders.

Mitigation Action:

- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers are used, the foam and retained liquid is suitably disposed.

ii. Fabrication / Erection / Civil Construction Works:

Control Measures provided:

- Suitable PPE like safety helmets, safety shoes, fall arrestors, safety nets, etc., are ensured.
- All project work related areas are Isolated/Barricaded.
- Suitable fire extinguishers and fire buckets are provided nearby.
- Suitable earthing is ensured.
- Periodical testing of Cranes, hydras, Lifting tools & tackles and Safety Harness are carried out as per statutory requirements.
- Housekeeping is maintained well

In case of Emergency:

- Any person noticing any sort of Incident, he/she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location / give first aid to the victim.

Mitigation Action:

- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers are used, the foam and retained liquid is suitably disposed.

III. DG SETs:

Control Measures provided:

- Smoke Sensors are provided inside the DG Building.
- Suitable fire extinguishers and fire buckets are provided nearby.
- Fire hydrant lines are provided.
- Housekeeping is maintained well

In case of Emergency:

- Any person noticing any sort of Incident, he / she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location / give first aid to the victim.

Mitigation Action:

- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers are used, the foam and retained liquid is suitably disposed.

IV. FO / DIESEL / PYROLYSIS OIL STORAGE AREA:

- Locations:
- i) Tanks near stores
 - ii) Diesel Tank and dispensing pump near Auto garage
 - iii) Pyrolysis oil tank at Kiln II platform
 - iv) Diesel Tanks (2 Nos.) at TPP Boiler Building

Control Measures Provided:

- The storage areas are fenced at specified safe distance and protected from all grass growth, waste materials and rubbish.
- The drainage arrangements are provided adequately to ensure that no stagnation of water is possible.
- Adequate numbers of suitable fire extinguishers and fire buckets are provided near the storage areas.
- Fire hydrant lines are provided near the storages.
- Double earthing provided for all tanks and at unloading point of tankers.

In case of Emergency:

- Any person noticing any sort of Incident, he / she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Care is taken to ensure that water containing oil does not escape outside the premises of the plant and also onto land, to mitigate the environmental impacts.
- In case of spillage, not allowing the fuel to flow through any drainage surrounding. Contain the fuel carefully by making bunds of sand.

Mitigation Actions:

- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers, used foam and retained liquid is suitably disposed.
- Salvage the fuel and use for any desired purpose or disposed as per the norms.
- Redress the contaminated land.

V. TPP BOILERS:

Location: Thermal Power Plant

Control Measures Provided:

- 3 Element Control Process Instrumentation Diagram (PID) is available to maintain Drum Level, Feed Water Flow and Steam Flow in the system. To cross-check the system, in addition to this PID loop, local drum level gauge and drum hydra-step are provided to monitor the drum levels.
- Total 3 Nos. of Pressure Safety Valve are located at Boiler drum (2 Nos.) and at main steam pipeline (1 No.).
- 1 No. of start-up vent valve is placed to relieve the excess pressure.
- Safety interlocks are provided to control flow of coal into boiler, whenever boiler ID fan trips and to control excessive positive or negative boiler furnace draft.
- Fire hydrant system (from TPP raw water tank) with dedicated DG set is available near the boiler.
- Adequate numbers of suitable Fire extinguishers and fire buckets are provided near the storage areas.
- Only Trained & Certified Boiler Engineers and Certified Boiler Attendants operate the system from control room as well as at field respectively.

In case of Emergency:

- Any person noticing any sort of fire / explosion at these areas immediately breaks the glass of manual call point completely, if available or he / she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.

- The emergency communication chart is shown in Annexure I of Safety Department.

Mitigation Actions:

- Boiler is shutdown in phased manner so as to avoid further aggravating the situation.
- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers used, foam and retained liquid is suitably disposed

VI. TPP TURBO GENERATORS

Location: Thermal Power Plant

Control Measures Provided:

- Interlock provided for Turbine condenser vacuum low to trip the turbine.
- Interlock provided to high vibrations at Turbine, Gear Box, Generator and high Generator winding temperature to avoid explosion
- Lightening Arresting Potential Transformer (LAPT) to quench the spark induced due to Lightening.
- Neutral Ground Resister (NGR) to avoid earth fault and fault current to Generator.
- Barricading the area to avoid unauthorized persons entry.
- Trained and Licensed Electrician / Wiremen to operate / maintain the HT electrical systems.

In case of Emergency:

- Any person noticing any sort of fire / explosion at these areas immediately breaks the glass of manual call point completely, if available or he / she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.

Mitigation Actions:

- Turbine is shutdown in phased manner so as to avoid further aggravating the situation.
- The debris is removed from site and disposed as wastes.
- In case of foam type extinguishers used, foam and retained liquid is suitably disposed

VII. COAL / OTHER SOLID FUEL STORAGE & CONVEYING:

Locations: Coal Yards,
Coal Stacker & Reclaimer,
Coal Hoppers / Bins,
Coal Conveyors

Control Measures Provided:

- All open storage areas are fenced at specified safe distance and protected from all grass growth, waste materials and rubbish.
- The drainage arrangements are provided adequately to ensure that no stagnation of water is possible.
- Adequate numbers of suitable Fire extinguishers and fire buckets are provided near the storage areas.
- Fire hydrant lines are provided near the storages and near the coal belt conveyors.
- Dust suppression system provided for mitigating fugitive dust from coal dropping points.
- The on-duty staff is trained in fire fighting techniques.
- The exit and entry are kept free for exit.

In case of Emergency:

- Any person noticing any sort of fire / explosion at these areas immediately breaks the glass of manual call point completely, if available or he / she immediately informs the

Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.

- The emergency communication chart is shown in Annexure I of Safety Department.

Mitigation Actions:

- The debris are removed from site and disposed as wastes.

VIII. MAIN ELECTRICAL SUB-STATION WITH SWITCH YARD:

Control measures provided:

- Rubber mats are provided in front and rear portions of the MCC panels.
- Voltage tested hand gloves are used.
- Double earthing of all transformers / equipments.
- Suitable fire extinguishers and fire buckets are provided. Smoke detection system is installed.
- Protection relays are provided to trip the circuits during fault.

In case of Emergency:

- Shift Electrician noticing any short circuit and fire immediately isolate the power, immediately inform Supervisor & break the glass of manual call point completely and contact CCR at phone No. 221, 222 & 223 for further action.
- Inform the main gate Security Officer to Emergency number 100 / 9849912300 in case of fire.
- If any person identifies any fire, immediately inform to Shift Electrician and extinguish the fire with fire extinguishers.
- The emergency communication chart is shown in Annexure I of Safety Department.
- The security staff immediately rushes to the spot and extinguishes the fire.

Mitigation Actions:

- The debris are removed from site is disposed as wastes.
- In case of foam type extinguishers used, the foam and retained liquid is suitably disposed.

IX. MCCs, PCCs & HT Panels:

Locations: MCCs, PCCs and HT Panels spread over Cement Plant and Thermal Power Plant

Control measures provided:

- Rubber mats are provided in front and rear portions of the MCC panels.
- Voltage tested hand gloves are used.
- Double earthing of all transformers / equipments.
- Suitable fire extinguishers and fire buckets are provided in all the load centers. Smoke detection system is installed.
- Protection relays are provided to trip the circuits.

In case of Emergency:

- Shift Electrician noticing any short circuit and fire immediately isolate the power, immediately inform Supervisor & break the glass of manual call point completely and contact CCR at phone No. 221, 222 & 223 for further action.
- Inform the main gate Security Officer to Emergency number 100 / 9849912300 in case of fire.
- If any person identifies any fire, immediately inform to Shift Electrician and will extinguish the fire with fire extinguishers.
- The emergency communication chart is shown in Annexure I of Safety Department.
- The security staff immediately rushes to the spot and extinguishes the fire.

Mitigation Actions:

- The debris are removed from site is disposed as wastes.
- In case of foam type extinguishers used the foam and retained liquid is suitably disposed.

X. ESPs:

Locations: ESP for Cooler - I
 ESP for Cooler - II,
 Hot ESP for Coal Mill - I
 Hot ESP for Coal Mill - II
 ESP for TPP - I
 ESP for TPP - II

Control Measures Provided:

- Any deviations in preheater outlet CO analyzer level above the predetermined values, immediately trip the ESP. Once it is controlled, ESP automatically gets started.
- The inlet temperature and CO at the pre-heater outlet are set at predetermined values and deviation in the same, actuate alarm in CCR.
- During the operation, all the ESP doors are in closed condition.
- Restriction of unauthorized persons into ESPs.

In case of Emergency:

- In case of any explosion, the CCR Officer immediately isolate the power supply to the ESP.
- Any person noticing any sort of fire / explosion at these areas shall immediately inform the main gate security at phone No. 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.

Mitigation Actions:

- The debris are removed from site category wise and dispose.

XI. BAG HOUSES / RABH / BAG FILTERS:

Locations: Raw Mill - I
 Raw Mill - II
 Coal Mill - I
 Coal Mill - II
 Slag Mill
 Cement Mill
 Limestone Crusher

Control Measures Provided:

- Any deviations in bag house differential pressure of the predetermined values, immediately give rise to the alarm in the CCR.
- Inert gas system is provided for Coal Mill bag houses to extinguish the explosion / fire. If Coal Mill Bag House gas temperature exceeds the predetermined value, alarm is actuated in the CCR and accordingly inert gas system gets activated.
- Fresh air damper is provided at Raw Mill bag house to control the temperature. If Bag House gas temperature exceed 200°C, alarm is actuated in the CCR and tripping the system at 250°C.
- Explosion vents are provided at Coal Mill I & II bag house to release the high pressure developed by the temperature in the system.
- Fire hydrant system (if any) to mitigate fire hazards.
- Fire extinguishers to mitigate fire hazards.

In case of Emergency:

- The CCR Officer on attention to the alarm of temperature levels, immediately contact the concerned Section In-charge (Mechanical) and inform the problem. They also inform concerned HOD for taking suitable action.
- The maintenance personnel on receipt of the information, charge the inert gas (for Coal Mills) through the system (if not kept in auto mode) provided and inform the CCR officer.
- If the temperature is in acceptable limits, the CCR officer start the circuit duly taking clearance from the Mechanical department.
- In case the magnitude of the problem is severe, i.e., in case of fire; the Mechanical personnel assess the intensity of the problem by opening the inspection doors of the filters.
- Any person noticing any sort of fire at these areas immediately informs the main gate security at phone No. 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.

Mitigation Actions:

- After putting the fire and temperature under control, the bags are inspected and the burnt bags if any are replaced and the system is restarted for ensuring that no spike / fire in the system.
- Segregate unburned material separately.
- The debris is removed from site disposed as wastes.

XII. BAGS GODOWN:

Location: Near Packing plant

Control measures provided:

- The bags storage building is of high roof design.
- Fire hydrant line is provided near the bag storage building.
- The electrical fittings are located in (outside) elevated places and the control is also given from outside the storage area.
- Suitable fire extinguishers and fire buckets are provided near the storage. Smoke detection system is installed.
- Employees / contract workmen working in this area are trained in fire fighting techniques.
- The exit and entry doors are kept free for exit.
- Gangways are provided to avoid spreading of fire from one lot to another.
- The height of stacking is restricted to slippage of bundles.
- Windows are kept in closed condition.

In case of emergency:

- Any person noticing any sort of fire at this area immediately breaks the glass of manual call point completely, if available or he /she immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with the help of fire extinguishers available at the location.

Mitigation Actions:

- Segregate the unburned material separately.
- The debris are removed from site disposed as wastes.

XIII. CYCLONE JAMMING:

Locations: Pre-heater Line - I & II

Control measures provided:

- All cyclones on the preheater are connected with online cone draft & material temperature indicators and interlocks at CCR.
- If the cyclone bottom cone drafts indication becomes zero, feed gets cut off in auto.
- If 5th cyclone temperature rises above 970 °C, the coal firing screw gets trip.
- Air blasters are available at 4th and 5th cyclone feed pipes with periodic purging of the air.
- Safe access is provided for cyclone jamming removal operations.
- Good housekeeping techniques are practiced near the cyclones.
- Fire resistant suit with fire protection shoes, goggles, hand gloves and face shield with helmet are provided to the operators working in these areas.
- Barricading the hot material flow areas viz., cyclones of lower level, cooler area along with posting security personnel at cooler areas.
- Restriction of unauthorized persons into the barricaded area.
- Work permit system is followed.

In case of emergency:

- Any deviations in cyclone cone draft / material temperature below the predetermined values, immediately give rise to the alarm in the CCR.
- The CCR officer on hearing the process alarm, immediately instruct the field attender to inspect the cyclone. After confirmation, CCR operator reduces / stops the feed to the Kiln.
- The CCR officer along with the shift staff assess the jamming condition by inspecting the cyclones through the inspection holes provided, by wearing appropriate PPEs.
- In case of considerable jamming tendency noticed, air lancing is executed from elevated platforms to release the jamming with skilled personnel duly taking care of all the safety precautions and using the respective personnel protective equipment and keeping safe distance.
- In case of excessive jamming tendency, HOD (Process) takes the help of trained personnel, who will take the situation under their control and personally supervise the operations. In such cases, HOD (Security) is communicated.
- The emergency communication chart is shown in Annexure I of Safety Department.
- The HOD (Process) ensures that the spilled material is removed to mitigate the environmental impacts that are associated.

Mitigation Action:

- The debris are removed from site and disposed as wastes.

XIV. LUBRICANTS STORAGE AREA:

Locations: i) DG
 ii) Main store
 iii) Auto garage
 iv) Raw Mill II area

Control Measures Provided:

- Suitable fire extinguishers and fire buckets are provided near the area of storages. Fire hydrant lines are provided near the storage areas.
- Good housekeeping is maintained at the storage areas.

In case of Emergency;

- Any person noticing any sort of fire at these storage areas immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location. In-case of small fires, the departmental staff extinguishes the fire with fire extinguishers.
- The main gate security staff on receipt of the information immediately reaches to the site and extinguishes the fire.
The emergency communication chart is shown in Annexure I of Safety Department.
- Isolate materials, which are not involved in the fire.
- In case of major oil spillages, the person noticing the same informs his immediate Superior who in turn report to the Section In-charges / HODs for taking corrective actions.

Mitigation Actions:

- The debris are removed from site is disposed as wastes, in case of spilled oil, the soiled earth from the area are collected and suitably disposed.
- In case of foam type extinguishers used, the foam and retained liquid is suitably disposed

XV. AIR RECEIVER TANKS:

Location: Refer RC/8.0/SF/03.

Control Measures Provided:

- High pressure relief valves are mounted and periodically inspected to know the healthiness of the relief valves, during the time of Statutory Testing.
- Auto drain valves are provided, as per supplier s specifications.
- Examination of air receiver tanks (Thickness of the shell, Hydrostatic test, etc.,) is periodically carried out as per AP Factories Rules, 1950.
- Auto compressor motor overload tripping and high temperature tripping are provided.

In case of Emergency:

- Any person noticing any sort of fire / explosion at these areas immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of safety department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location.
- In case of burning of any material, the area near the vicinity cleared without any combustible material.

Mitigation Actions:

- Vent is provided to release high pressure.
- The debris are removed from site and disposed as wastes.

XVI. ALL OFFICE AREAS / LAB / CCR

Locations:	QC Laboratory --	Fire
	CCR	-- Fire
	All Office Areas --	Fires

Control measures provided:

- Emergency doors (apart from ordinary doors) are arranged as escape routes.
- Smoke detection system is installed.
- Suitable fire extinguishers are provided.

In case of Emergency:

- Any person noticing any short circuit and fire shall immediately isolate the power, informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- If any person identifies any fire, shall immediately extinguish the fire with fire extinguishers, if he is trained in fire fighting.
- The emergency communication chart is shown in Annexure I of Safety Department.
- The security staff shall immediately rush to the spot and extinguish the fire.

Mitigation Actions:

- The debris are removed from site is disposed as waste.
- In case of foam type extinguishers used, the foam and retained liquid is suitably disposed

XVII. ACID/ BASE STORAGE AND HANDLING

Location: Thermal Power Plant

Control Measures Provided:

- Acid tanks are mounted with fumes absorption system.
- Water quenching system is placed for acid tanks.
- Double earthing system is provided for acid / base tanks.
- Barricading the area to avoid unauthorized persons entry.
- Dyke wall is constructed and the drain is connected to effluent treatment plant.
- Rubber lined tanks are used for acid / base storage.
- Acid / alkali proof suits are available.

In case of Emergency:

- Any person noticing any sort of leakage at this area immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Spill out acid / base are collected into carboys by wearing appropriate PPEs.
- The area is washed with plenty of water and passed to effluent treatment plant.

Mitigation Actions:

- System is restored after thorough checking for leakage, if any.

XVIII. STORES:

Location: Plant

Control Measures Provided:

- The storage areas are fenced at specified safe distance and protected from all grass growth, waste materials and rubbish (except for temporary storage).
- The drainage arrangements are provided adequately to ensure that no stagnation of water is possible.
- Adequate numbers of suitable fire extinguishers and fire buckets are provided near the storage areas. Smoke detection system is installed in the stores office & bag filters storage room.
- Fire hydrant lines are provided near the storages.

In case of Emergency:

- Any person noticing any sort of fire at this area immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location.
- In case of burning of any material, the area near the vicinity cleared without any combustible material.

Mitigation Actions:

- The debris are removed from site disposed as wastes
- In case of foam type extinguishers used the foam and retained liquid is suitably disposed

XIX. CANTEEN / MESS / GUEST HOUSE / FOOD PREPARATION

Control Measures Provided:

- LPG Gas detection system is installed at Canteen.
- Adequate numbers of suitable fire extinguishers are provided near all these areas.
- Nose mask, Head cap, Hand gloves and apron provided for all workmen at these areas.

In case of Emergency:

- Any person noticing any sort of fire or short circuit at these areas immediately informs the Security Officer to Emergency number 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to extinguish the fire with help of fire extinguishers available at the location.
- In case of any food poison, necessary immediate treatment is given at OHC, with proper precautions. Help of nearby hospitals is taken in co-ordination with HOD (M&OHS).

Mitigation Actions:

- The debris are removed from site disposed as wastes
- In case of foam type extinguishers used the foam and retained liquid is suitably disposed

XX. SNAKE BITE:

Control Measures Provided:

- Snake catchers are provided with security personnel to catch snake.
- Snake repellent chemicals are being sprayed in vulnerable areas.

In case of Emergency:

- Any person noticing any sort of snake bite, immediately informs the main gate security at phone No. 100 / 9849912300 and gives details of the incident, the exact location.
- The emergency communication chart is shown in Annexure I of Safety Department.
- Before the arrival of security staff, the personnel available at the spot try to give first aid (if the person knows).
- Snake venom vaccine is injected to the victim, which is kept available at OHC, with proper precautions.

Mitigation Actions:

- The snake holes are closed with proper precautions and snake repellent is spread around the area.

B. DISPOSAL OF DEBRIS:

Debris is segregated into:

- a. Hazardous Waste (including oil & grease soaked cloth)
- b. E-Waste
- c. Iron / Metal Scrap
- d. Solid Waste (other than a, b & c)

Segregated wastes are disposed as per the category, as per PR/8.0/MT/10 - Disposal of Waste .

C. EMERGENCY PLANNING:

Emergency planning exercises for on-site and off-site scenarios required for preparing an Emergency Preparedness & Response Plan are different. However, they are complementing each other. This study is focused on the possible hazards confined within the plant and the corresponding action plan (On-site plan).

The responsibilities and actions expected from the Government Departments during an emergency are sought for off-site plans. In order to handle emergency situations, an Emergency Plan Organization Structure entrusting responsibility to various personnel is prepared with their specific roles during emergency.

The possible composition of the management team is:

1. Unit Head
2. Works Head
3. Admn. Head Communication Controller
4. HOD concerned
5. Section In-charge concerned
6. HOD (HR)
7. HOD (Medical & OHS)
8. HOD (Safety)
9. HOD (Security)
10. First aiders
11. Fire fighters

INFRASTRUCTURE:

Following infrastructure and operational system are provided to meet any emergencies:

- Fire Tender
- Ambulance
- Fire Hydrant System
- Fire Extinguishers
- Fire Suits
- Self Contained Breathing Apparatus
- Smoke Detection Systems
- Fire Sirens

- Trolley Mounted Fire Pump
- First Aid Boxes
- Occupational Health Centre

EMERGENCY CONTROL CENTER:

Emergency control center is located at Administrative building Unit Head cabin. This center is provided with the following facilities:

- a) Plant lay out specifying Emergency Assembly Points
- b) Emergency Telephone Roster
- c) Telephone line with STD facility
- d) List of first aiders
- e) List of fire fighters
- f) Incident log

EMERGENCY ASSEMBLY POINTS:

On hearing of emergency siren, all persons proceed to emergency assembly points. If possible employees including contract workmen, inform their respective superiors. Visitors & others ask for help with nearby employees to assemble at emergency assembly points depending on the wind direction.

The emergency assembly points are located at:

1. Time Office.
2. Auto Garage.
3. Workshop.
4. CCR Building.
5. Packing Plant Rest Hall.

COMMUNICATION SYSTEM:

Emergency Sirens are provided at:

- Line-1 Pre-Heater
- Line-2 Pre-Heater
- Cooler MCC room top
- Raw mill-1 Bucket elevator
- CCR building
- Packing plant

In case of any emergencies, all are alerted by using emergency siren. Emergency sirens are activated by Security personnel after getting consent from Chief Controller.

The emergency siren tone is:

- Fire / Gas Release : Wailing sound for two minutes
- All Clear : Continuous sound for two minutes

Walkie-talkie, Mega phone, telephone (intercom / cell phone), using predetermined codes of communication are used during emergency.

D. ON-SITE EMERGENCY PLAN:

This On-Site Emergency Plan is followed in case of the following major emergencies;

- Major outbreak of uncontrollable fire / explosion.
- Leakage of acid tanks

Objectives:

- Controlling the emergency and eliminating the hazards.
- Head count and rescue operations.
- Treatment of the injured.
- Safe guarding the personnel by timely evacuation.
- Minimizing the damage to property and the environment.
- Informing and assisting the relatives of the injured.
- Informing and co-ordination with the statutory authorities.
- Preserving records.
- Ensuring safety of the personnel and site conditions before the personnel re-enter and resume the work.
- Investigating and taking steps to prevent reoccurrence.
- Restore normalcy and confidence.
- Recovery of casualties / witnesses after critical incident.

Emergency Organization Structure:

The Emergency Organization Structure is given in AN/8.0/SF/02.

Declaration of Emergency:

Unit Head is the Chief Controller for declaring the Major Emergency. In his absence, Works Head shall act as Chief Controller for the operations.

ROLES OF VARIOUS PERSONNEL IN CASE OF EMERGENCY:

Role of Incident Controller

- Rush to the incident site and co-ordinate with Emergency Controller / Site Controller for rescue operations.
- Mobilize the staff towards various actions.
- Take decision whether to stop or continue the operation of concerned section in consultation with other HODs and Works Head.
- Initiate rescue of personnel affected in the emergency and arrange for immediate first aid with the help of available first aiders.
- Assign responsibility to the available first aiders / fire fighters the following activities:
 - Rescue of injured / affected personnel and render first aid
 - Fire fighting activities
 - Organize evacuation of unwanted personnel to Emergency Assembly Points
- Remain as Incident Controller till the end of emergency.
- Follow line of communication / command till it is taken over by Chief Controller / Site Controller / Emergency Controller.
- Continuously monitor the rescue and relief operations.
- Act as Emergency Controller in his absence.

Role of Site Controller

- Act as Chief Controller in his absence.
- Rush to the incident site, take overall charge, assess the gravity of the situation and report to the Chief Controller to call external help from neighbouring plants and local Fire brigade, if required.
- Provide information and instructions to Incident Controller.
- Advise Chief Controller to declare on-site emergency, if the need arises.
- Request the Chief Controller for additional help, if required.

- Ensure for the evacuation of the persons at safe places.
- Coordinate for head count, search for casualties / missing personnel and necessary first aid.
- Coordinate first aiders and fire fighters.
- Immediately act for the necessary resources for the rescue operations.
- Coordinate with all the relevant departments to effectively control the emergency situation.
- Ensure that the evidence is preserved for enquiries by statutory authorities, if any.
- Declare all-clear, in consultation with Incident Controller.
- Initiate post emergency measures.

Role of Chief Controller

- Reach emergency control center.
- After taking feedback from the Site Controller and other senior officials, shall review the situation immediately and depending on the impact, declares the On-site Emergency.
- Continuously review the actions and give instructions to the senior persons down the line.
- Shall visit to the site and assess the situation.
 - Contact neighbouring plants as required by the Site Controller.
 - Keep liaison with civic and statutory authorities, if required.
 - Coordinate with Corporate Office and provide authorized statements to news media.
 - Authorize to declare the conclusion of on-site emergency.
 - Ensure that the statutory authorities are informed by the concerned.
 - Keep contact with Site Controller, Emergency Controller and Incident Controller.

Role of Communication Controller:

- On receiving information from Incident Controller about emergency, obtain the details such as :
 - Type of emergency
 - Emergency location
 - Emergency cause
 - Wind direction
- Start incident log with time of every event, message transmitted and received. However, incident log is not required for mock drills.
- Instruct Security personnel at the main gate to regulate the traffic.
- Coordinate with Emergency Controller, Site Controller and Chief Controller.
- Communicate with external bodies in consultation with Chief Controller and release authorized statements.
- The services such as transportation, extra medical assistance and canteen facilities are organized depending upon the requirement.

Role of HOD (HR):

- Reach Emergency Control Centre.
- Keep liaison with Emergency Controller.
- Assist Chief Controller to liaise with civic authorities.
- The services such as transportation, extra medical assistance and canteen facilities are coordinated depending upon the requirement.
- Inform the affected employee s families about their welfare.
- Arrange to take roll call / head count of all the people in the Emergency assembly points and check with the attendance.
- Look after the functions of Communication Controller in his absence.

Role of HOD (M&OHS):

- Attend the injured at Occupational Health Center (OHC) / on-site, if required.
- Refer the injured for expert advice and treatment, if required
- Advise medical team about the method of treating the injured.
- Supervise first aid treatment and transportation of the injured.
- Coordinate with Medical Team and hospitals at Vijayawada / Jaggaiahpet / nearby hospitals as per the need basis.
- Keep liaison with Emergency Controller.
- Ensure the availability of emergency instruments and medicines / antidotes.
- Recovery of casualties / witnesses after critical incident.

Role of HOD (Safety):

- Reach the emergency site immediately.
- Coordinate with Incident Controller / Emergency Controller / Site Controller.
- Coordinate in safe evacuation of people in consultation with Incident Controller / Emergency Controller / HOD (Security).
- Coordinate with first aiders & fire fighters.
- Arrange necessary PPEs.
- Ensuring safety of the personnel and site conditions before the personnel re-enter and resume the work.
- Investigating and taking steps to prevent reoccurrence.

Role of HOD (Security):

- Finalize the safe route of evacuation in consultation with emergency controller and based on wind direction.
- Provide safe route for fire tender & ambulance.
- Provide assistance to emergency controller in handling the emergency situation.
- Ensure the traffic control and control the gathering.
- Depute staff for fire fighting & rescue operations
- Coordinate with police for possible evacuation and traffic control, in case of an Off-Site Emergency
- Call for the additional staff to meet the demand.
- Organize possible evacuation from the site as well as the Emergency Assembly Points.
- Coordinate for stopping railway / road vehicles traffic to the plant.
- Ensure Security gates (Company entrance gate & Thanda gate) are closed to avoid the entry of vehicles during emergencies except emergency vehicles like fire tender / ambulance.
- Coordinate with Incident Controller / Emergency Controller
- Ensure posting of at least one person at Fire Room to issue safety / fire tendering equipment.
- Coordinate in safe evacuation of people.
- Ensure security guard is accompanied to guide the outside Fire Services to the spot of emergency, by following the perpendicular / upwind direction and to coordinate.
- Ensure the availability of sufficient fire fighting equipment.

Role of Time Keeper:

- Immediately after receiving the emergency call, follow Emergency communication chart (Annexure 1). In absence of Time Office, Shift-In-charge (Security) takes this role.
- Arrange for Fire Tender & Ambulance as per the need.
- Inform available First aiders and Fire fighters.
- Allow-in, only those persons who are connected with the emergency.
- Keep visitors and VIPs waiting at Time Office

Role of Fire Fighters:

- On getting the information of the fire / explosion from Time Office, immediately rush to the incident site.
- Fire fighting operations started with fire tender, all the suitable equipment and available resources.
- Act as per the instructions of HOD (Security) and coordinate with Incident Controller.

Role of First Aiders:

- On getting the information of incident from Time Office, immediately rush to the incident site.
- Rescue the causality, if any. Provide first aid treatment and accompany at ambulance up to OHC.
- Coordinate with incident controller.

Roles & duties of employees:

The following are Dos & Don'ts of the employees at site during emergencies:

- Do not get panic.
- Do not spread unauthentic information.
- Proceed to the Emergency Assembly Point(s) after informing your superior, if available.
- Do not approach the scene as a spectator.
- Do not engage telephone unnecessarily.
- Do not move about unnecessarily.
- In case, if have a specified role in the emergency, act as per the plan.
- Accompany your visitors to the Emergency Assembly Points.
- Be attentive to all information.
- If you are part of emergency plan, rush to the factory or wait for instructions.
- Messages via telephones are restricted to key personnel only. Messages to others if necessary shall transmitted through HOD to subordinates. This enables the telephone exchange free for key personnel for communications.

D. Training & Mock Drills:

- An emergency action plan is communicated to all the employees of the organization and appropriate training is imparted. Concerned HOD / HOD (Personnel) are responsible for this.
- Mock drills for On-Site Emergency Preparedness are conducted periodically (the periodicity is once in a year) and minutes recorded. In addition to that, minor mock drills are conducted in individual sections in the plant to create more awareness on On-Site Emergency Preparedness Plan. Total 3 mock drills covering total plant area per year are conducted. The communication of emergency for the particular section is announced by Mega Phone. No emergency siren required for this type of minor mock drills.
- With respect to minor mock drills, the data is recorded in Minor Mock Drills Report.

E. OFF-SITE EMERGENCY PLAN:

The Off-Site Emergency Plan defining various steps to tackle any offsite emergencies, which affect surrounding areas of the plant, has to be prepared after due finalizing discussion in this respect with local Panchayat official, Revenue officials and District Collector of Krishna. As per this off site emergencies, actions are promptly initiated to deal with, in-consultation with District Collector and other revenue / civic officials.

Fire Extinguishers :

Place	ABC				CO ₂			BC (OLD TYPE)			FOAM		WATER		Total	Fire Buckets
	9 Kg	6 Kg	5 Kg	2 Kg	9 Kg	4.5 Kg	2 Kg	22.5 Kg	10 Kg	5 Kg	50 Ltr.	9 Ltr.	50 Ltr.	9 Ltr.		
Plants	130	1	1	1	1	27	27	3	9	31	3	19	1	3	257	68
Colony	23	3	1	4		6	3		54	29		1			124	4
Mines	17				1	11									29	38
Total	170	4	2	5	2	44	30	3	63	60	3	20	1	3	410	110

Nearby Hospitals

Name of the Hospital	Name of the Doctor	Qualification	Contact Number	Distance from Plant, km
Jaggaiyyapet :-				
Govt Community Health Centre	Dr Vijaya Raman	M.B;B.S.,	08654 -222484	8
	Dr Venkateswara Rao	M.B;B.S.,		8
Seetha Rama Laxmi Memorial Nursing Home **	Dr Aruna	M.B;B.S.,	08654- 222153	8
Sri Rama Nursing Home	Dr B Yogiram	M.B;B.S.,M.S (Gen Surgery)	08654-222331	8
Swathi Maternity Nursing Home	Dr Vajramala	M.B;B.S.,D.G.O	08654 -222639/ 224998	8
	Dr Vara Prasad	M.B;B.S.,M.S(Gen Surgery)	08654 -222639/ 224998	8
Sri Laxmi Orthopedic Hospital	Dr Sridhar	M.B;B.S.,D.Ortho	08654 -225151	8
Swathi Children nursing Home	Dr Seshagiri Rao	M.B;B.S.,D.C.H	08654-223460/ 223480	8
Sai Dental Clinic	Dr D Nageswara Rao	B.D.S	08654 -225221	8
Prabhat Nursing Home	Dr S V Narasimha Rao	M.B;B.S., D.O	08654 -224662/ 222151	8
Punnaiah Memorial Mother & Child Memorial Hospital	Dr Laxmi Tulasi	M.B;B.S.,D.G.O	08654 -223917/ 229117	8
Vishnavi Nursing Home **	Dr S Vamsi Priya	M.B;B.S., M.D(Gynic)	08654 -223335	8
Nandigama:-				
Samatha Nursing Home	Dr Leela Prasad	M.D (Gen)	08678 -275617	25

** Having Empanelment with RCL, Jayanthipuram.

Reference Hospitals at Vijayawada

Name of the Hospital	Contact Number	Distance from Plant, km
Nagarjuna Hospital **	0866 -2554701-09	75
Ramesh Cardiac & Multi Specialty Hospital **	0866 - 2484800/2484811/2484822	75
MVS Accident & Trauma Care Hospital (Dr MJ Naidu) **	0866 -2435555	75
Trust Hospital (Dr UV Ramana) **	0866 -2470909	75
Sentini Hospitals	0866-6677869	75
Liberty Hospital	0866-2554888	75
Nori Multi Speciality Hospital	0866-2444747	75
Rainbow Hospital	0866-2444242	75
Andhra Hospitals	08666-6626877 (M); 0866-2415757 (B)	75
