8.1 Definition of Risk

Risk (R) is thus defined as function of possibility of occurrence of hazard (f) and magnitude of its consequence (D).

Risk (R) = f (Hazard, Probability, Consequence)

In most of the applications, however, risk may be defined as

Risk (R) = Probability (f) * Consequence (D)

8.2 METHODOLOGY

Quantitative risk assessment (QRA) is a means of making a systematic analysis of the risks from hazardous activities, and forming a rational evaluation of their significance, in order to provide input to a decision-making process. The term ‘quantitative risk analysis’ is widely used, but strictly this refers to the purely numerical analysis of risks without any evaluation of their significance. The study has been conducted based on the premises of a traditional Quantitative Risk Assessment. The key components of QRA are explained below, and illustrated in Figure 1.
### TABLE 1: PROCESS HAZARDS AND ITS CONTROL

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the possible hazard or emergency</th>
<th>Its source &amp; reasons (Activity)</th>
<th>Its effect on persons, property &amp; environment</th>
<th>Place of effects</th>
<th>Control Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Boiler 1. Burning 2. Physical Injury 3. Explosion</td>
<td>Boiler-likely to cause due to temperature/pressure build up</td>
<td>Person and property</td>
<td>Factory Premises</td>
<td>Standard and necessary fittings to be provided regular inspection to be carried out.</td>
</tr>
<tr>
<td>02</td>
<td>Induction Furnace 1. Burning 2. Physical Injury 3. Explosion</td>
<td></td>
<td>Person</td>
<td>- Do -</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>SID Plant – Rotary Kiln</td>
<td>Rotary Kiln – Likely to cause due to rotate and high temperature</td>
<td>Person</td>
<td>Factory Premises</td>
<td>Standard and necessary fittings to be provided regular inspection to be carried out.</td>
</tr>
<tr>
<td>05</td>
<td>Bad House Keeping 1. Injury 2. Burning 3. Fire</td>
<td>Bad House Keeping</td>
<td>Person &amp; Property</td>
<td>Factory Premises</td>
<td>Regular inspection of plant on day-to-day basis, Proper placement of materials.</td>
</tr>
<tr>
<td>06</td>
<td>Structural Collapse 1. Injury</td>
<td>Due to over loading of machinery, bad workman ship of construction Earthquake</td>
<td>- Do -</td>
<td>- Do -</td>
<td>Structural stability to be obtained from Chartered engineer, load bearing capacity to be checked, regular inspection of plant.</td>
</tr>
</tbody>
</table>
Figure -1
Layout of the Plant
8.3 TRANSPORTATION OF RAW MATERIALS

8.3.1 Emergency Action Plan for Transportation

**Role of Transporter:**

- “Tremcard” must be obtained from the respective supplier and to be kept on vehicle with driver.
- Emergency information panel shall be placed on the front sides and rear.
- The Driver must hold valid driving license for HMV.
- The driver must possess a certificate for transportation of hazardous goods.
- First-aid, Safety and fire appliances shall be kept in vehicle and maintained properly.
- In case of emergency, the driver should inform immediately to Colourtex, Transporter, Fire Brigade, Police and Ambulance.
- The tanker driver shall initiate emergency actions as per the TREMCARD.

8.3.2 INCASE OF EMERGENCY, DIAL POLICE (100), FIRE BRIGADE (101) AND AMBULANCE (102)

**Role of Fire Brigade:**

- On being received the emergency call the officer of fire brigade shall rush immediately to incident site with water tender and adequate fire squad to deal the emergency in case of fire, spillage as indicated under Tremcard.
- Assess the situation on arrival and decide whether the appliances and equipment he has, or will shortly have, are sufficient to control the fire.
- Rescue arrangement shall be made for injured persons.
- Due to sudden accident, panic situation may be controlled by use of P.A. System.
- Other emergency services i.e. police; hospital and local authority are to be informed through control room for follow up action.
- Serious injured person is to be sent immediately to the hospital as soon as possible.
- Arrangement is to be made to stop leakage from the tanker.
- Arrangement is to be made to contain spilled material immediately by with inert materials like sand or earth.
- Stop smoking & other ignition source in vicinity.
- Mobilization of vehicles and crowd is to be controlled.
- Line of hose is to be laid down to tackle fire if occurs in the spilled or in the tanker.
- Stop the engine in case of running.
- Name and address of victims, who was rescued / given first-aid / sent to hospital, shall be noted and written in occurrence book and other copy is to be submitted to the nearest police station.
- On completion of operation incidence report is to be submitted to the CFO, Head Quarter.

**Role of Medical Wing:**

- At the time of emergency, providing quick and adequate medical relief to the victims of incidence will have to be given on top most priority.
- Provide emergency aid at site of incident by special unit equipped.
- Make arrangement for adequate stock of antidotes, life saving drugs & medicines.
- Make arrangement for ambulance, stretchers, First-aid kits etc.
➤ Get the details from first-aid post, casualty-receiving center & prepare report.

**Role of Police:**
➤ Control and regulate the traffic within the area of incident.
➤ Assist the fire brigade by cordoning off the affected area and help the fire fighting by supplementing fire fighting personnel to the extent possible.
➤ Assist the medical personnel in evacuating causalities.
➤ Prevent unauthorized entry into the affected area.
➤ Control general law and order.

**Role of Nilkanth Concast Pvt Ltd.:**
➤ Provide the driver with a “TREMCARD” written in Gujarati, Hindi and English language that explained him emergency actions i.e. what to do in case of fire, spillage and contact telephone numbers.
➤ Provide the transport route of the carrier to the port. This route must stay constant all the time.
➤ Inform the local authorities along the route of what actions to take if an incident occurs and to avoid contaminating the area.
➤ If disposal is necessary, follow the disposal procedure as per guidelines of R&H.
➤ Investigate the incident and develop report to prevent recurrence.

**“RUSH TO THE INCIDENT SITE IMMEDIATELY AS AND WHEN RECEIVE THE EMERGENCY CALL”**
8.4 Components of Risk Assessment

8.4.1 Hazard

Hazard is an inherent property of a substance, agent and source of energy or situation having the potential to cause undesirable consequence (e.g. properties that can cause adverse effects or damage to health, the environment or property).

8.4.2 Hazard Identification

Hazard identification is systematic investigation of the possible hazards associated with an installation, particularly identification of the hazards of the materials (s) that can cause injury or death to people or damage to property by the release of energy in the event of an accident. The hazard identification is described below:

8.4.2.1 Physical Hazard

- Temperature - Heat → from Kiln
- Illumination → from Electricity
- Noise → from Machinery
- Vibration → from Machinery
- Radiation → from Process
- Atmospheric pressure → from Process

8.4.2.2 Electrical Hazards

- Electrical hazards due to the electrical major equipment/ machinery, operations, welding, motors, and heavy lift devices, cabling, human intervention (short circuit possibility), maintenance work (due to machinery breakdown etc.), plant lighting related electrical hazards.
- Possibilities of fire hazards at transformers, switchgear and other electrical equipment etc.

8.4.2.3 Mechanical hazards

Defective design of machinery, defective procedures, unguarded machinery, protruding & moving parts, falling heavy objects & poor ergonomics.
- Possibility of human injury due to working with mechanical machines, manual handling etc.
8.4.2.4 Psychosocial hazards
Type of work, risks involved in work, monotony, and long working hours, lack of recognition & job satisfaction, poor man made management, lack of welfare activities, tensions at home & work place.
- Major dropped objects hazard due to large number of physical handling steps / operations involved with crane/ overhead lifting/ hoisting equipment.
- Fires in any part of the plant working areas – there is a possibility of rapid escalation if it is not brought under control quickly.

8.4.2.5 Biological hazards
Viruses, rickettsiae, bacteria, fungi, protozoa and helminthes transmitted in certain occupations.

8.5 Determining Significance
Determining Significance is evaluation of the significance of the risk estimation and each of the components of the risk assessment process, including elements of risk perception and cost/benefit consideration.

8.6 Risk Management
M/s. Nilkanth Concast Private Limited will be managed the economical and social aspects of risk. Improvement in scientific and factual basis for risk assessment is necessary for better risk management decisions and public creditability of those decisions. However, M/s. Nilkanth Concast Private Limited has done the QRA to be undertaken prior to risk management decisions. M/s. Nilkanth Concast Private Limited will be considered the Risk management strategies including all the specific activities. First step involves taking a decision about the weather any actions are necessary and if so, what nature of the action should it be. Industries’ risk management decision shall be based not only computed risk in terms of fatality probability (fatality/year), but also on judging the acceptability of the risk – a matter of personal and social value judgment. The risk management includes implementing the actions, decided upon and evaluating their effects.

The fatality probability is function of:
- Probability of occurrence of hazardous events
- Probability of weather condition, wind direction
- Probability of number of persons exposed which depends on the severity of the consequences
- Lethality factor
- Probability of ignition source
On the basis of risk Assessment, Company has defined its own risk management plan, which is explained as follow.

8.7 Quantitative Risk Assessment
8.7.1 Identification of Risk Areas

The procedure for QRA starts with identification of major risk areas in the installation. Operation carried out in SID Industries usually come under certain board, general categories. In M/s. Nilkanth Concast Private Limited, major risk areas will plant area and utility area.

8.7.2 Identification of Failure cases for risk areas

- Horizontal Rotary Kiln
- Boiler area
8.8 OCCUPATIONAL HEALTH & SAFETY
For large industries, where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance; the men, materials and machines are the basic inputs. Along with the boons, industrialization generally brings several problems like occupational health and safety.

The industrial planner, therefore, has to properly plan and take steps to minimize the impacts of industrialization and to ensure appropriate occupational health and safety including fire plans. All these activities again may be classified under construction and erection, and operation and maintenance.

Health of all the employees in plant area will be regularly monitored by outside physician. If any abnormality will found necessary treatment will also being given time to time. Necessary history cards, records will also be maintained which is up-dated time to time.

8.8.1 OCCUPATIONAL HEALTH
Occupational health needs attention both during construction & erection and operation & maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

8.8.1.1 CONSTRUCTION AND ERECTION
The occupational health problems envisaged at this stage can mainly be due to constructional accident and noise. To overcome these hazards, in addition to arrangements to reduce it within TLV's, necessary protective equipments shall be supplied to workers.

8.8.1.2 OPERATION AND MAINTENANCE
The problem of occupational health, in the operation and maintenance phase is primarily due to noise which could affect consultation. The necessary personal protective equipments will be given to all the workers. The working personnel shall be given the following appropriate personnel protective equipments.

- Industrial Safety Helmet;
- Face shield
- Zero power plain goggles with cut type filters on both ends;
- Zero power goggles with cut type filters on both sides and blue color glasses;
• Welders equipment for eye and face protection;
• Cylindrical type earplug;
• Ear muffs;
• Canister Gas mask;
• Self contained breathing apparatus;
• Leather apron;
• Aluminized fiber glass fix proximity suit with hood and gloves;
• Boiler suit;
• Safety belt/line man's safety belt;
• Leather hand gloves;
• Asbestos hand gloves;
• Acid/Alkali proof rubberized hand gloves;
• Canvas cum leather hand gloves with leather palm;
• Lead hand glove;
• Electrically tested electrical resistance hand gloves; and
• Industrial safety shoes with steel toe.

8.8.1.3 HOSPITAL FACILITIES
It is proposed that client will make formal agreements with nearby hospital having facilities to attend fire effect cases for attending the affected persons in the emergency arising out of accidents, if any.

8.8.1.4 FACTORY MEDICAL OFFICER
A qualified doctor will be appointed as FMO on retainer ship basis. Apart from him, Paramedical Staff will be employed.

8.8.1.5 EXISTING FACILITY IS AVAILABLE AT FIRST AID CENTRE
1. Snake Bite Lancet
2. Rub Spirit- Iso Propyl Rubbing Alcohol (LR Grade—I.P.A)
3. Hydrogen Peroxide 100ml
4. Dettol
5. Absorbent Cotton Wool
6. Safety Pin
7. Kidney Tray
8. Cutter (scissors)
10. Medium Cotton Gauze Swab Sterilise Absorbent (sterilized dressings).
11. Large Cotton Gauze Swab Sterilise Absorbent (sterilized dressings).
12. Sterilised Eye Pad
13. Triangular Bandage
14. Paracetamol
15. BURNOL
16. SOFramycin
17. Workadine Ointment 5% W/W
18. Netraprabha Eye Drop
19. Ciproxy Eye/Ear Drop
20. Reli spray
21. IODEX
22. MOOV
23. Digital thermometer
24. Medical Oxygen Cylinder

8.8.1.6 PROPOSED FACILITY TO BE MADE AVAILABLE AT OHC

One Room is proposed to be provided to be operated as OHC. The centre will be equipped with following medical equipments:—

1. Examination Table
2. Dressing Tables For performing Dressing
3. Glucometer For measurement of Blood Sugar
4. Vision chart To evaluate vision acuity
5. Nebulizer For relieving coughs & Breathing Difficulty
6. Infra red light for relieving muscular pain
7. Suction machine For cleaning airway
8. Autoclave machine For sterilizing cotton & dressing material
10. Sphygmomanometer To measure blood pressure
12. Refrigerator To preserve medicines

8.8.1.7 AMBULANCE VAN

An ambulance van is proposed to be made available 24 hours at Fire Station.
8.8.1.8 PERIODIC MEDICAL EXAMINATION

It is proposed that client will ensure that...

1. Workers employed shall be medically examined by a qualified medical practitioner/ Factory Medical Officer, in the following manner:
   (a) Once in a period of 6 months, to ascertain physical fitness of the person to do the particular job;
   (b) Once in a period of 6 months, to ascertain the health status of all the workers in respect of occupational health hazards to which they are exposed and in cases where in the opinion of the Factory Medical Officer it is necessary to do so at a shorter interval in respect of any workers;

© In periodic and pre-medical examinations, various parameters will be checked. Viz., LIVER FUNCTION TESTS, Chest X-rays, Audiometry, Spirometry, Vision testing (Far & Near vision, color vision and any other ocular defect) ECG and other parameters as will be found necessary as per the opinion of Factory Medical officer.

2. No person shall be employed for the first time without a certificate of granted by the Factory Medical Officer.

8.8.1.9 EMP for the Occupational Safety & Health hazards so that such exposure can be kept within permissible exposure level (PEL)/Threshold Level value (TLV) so as to protect health of workers.

1. It is proposed to formulate and implement an EMP for Occupational Safety and Health with following aims...
   - To keep air-borne concentration of toxic and hazardous materials below PEL and TLV.
   - Protect general health of workers
   - Providing training, guidelines, resources and facilities to concerned department for occupational health hazards.
   - Permanent changes to workplace procedures or work location to be done if it is found necessary on the basis of findings from workplace Monitoring Plan.
2. It is proposed that this EMP be formulated on the guidelines issued by Bureau of Indian Standards on OH&S Management Systems: IS 18001:2000 Occupational Health and Safety Management Systems

3. Proposed EMP will be incorporated in Standard Operating Procedure also.

4. The proposed EMP will also include measure to keep air-born concentration of toxic and hazardous materials below its PEL and TLV, like:
   a. Leak Surveys
   b. Exhaust Ventilation
   c. Proper illumination
   d. Close processes to avoid spills and exposures
   e. Atomization of process operations to hazards of manual handling of materials
   f. Supply of proper PPEs like Air mask, Berating canisters, SCBA sets, On-line breathing apparatus at the places
   g. Decontamination procedure for empty drums and carboys.
   h. Regular maintenance program for pumps, equipment.

8.8.1.10 MEDICAL SURVEILLANCE PROGRAM

Pre-employment Medical Check Up

1. Chest X-ray
2. Audiometry
3. Hematological Examination:- CBC, SGOT, SGPT, Cholesterol, Blood Sugar etc
4. Urine Examination
5. Vision test
6. Colour blindness test
7. Lung function test- Spirometry

Periodical Medical Check up

1. Lung Function test
2. Audiometry
3. Hematological Examination
4. Urine examination
5. Vision test
6. Colour blindness test
7. Biomarker in Blood & Urine

8.8.1.11 Safety Plan for Occupational Health Hazards:
The health of workers can be protected by adopting the following measures:

_ Proper designing of building & work area.
_ Good Housekeeping practices.
_ Well engineered ventilation & exhaust system.
_ Enclosure/isolation of specific areas.
_ Enforcement of usage of Personal Protective Devices.
_ Regular Work Environment Monitoring.
_ Signboard will be provided at unsafe area.
_ Statistical Monitoring.
_ Working hours & job rotation of employees in specific areas to avoid continuous exposure.
_ Occupational health awareness program by the medical officer/safety officer/environment officer of the company for Employees and Contract Workmen.
_ Risk assessment & imparting occupational health training.
8.9 FIRE FIGHTING SYSTEM

M/s. Nilkanth Concast Private Limited management shall take in to consideration fire prevention measures at the project planning and during plant commissioning stage to avoid any outbreak of fire. But looking to the hazardous nature of process and the materials that shall be handled and processed, the chance of outbreak of fire cannot be totally ignored. Hence to tackle such a situation a good well laid fire protection system will be provided in the factory. Details of fire fighting are given below.

- **Fire System:** Fire Hydrant fully equipped system in Auto mode.

100 KL Water storage reservoir.
- 04 nos Jockey Pump
- 02 Nos Electrical Main Pump 75 HP
- 25 Nos of Hydrant post & 05 nos of Jet Monitor.

We have fire hydrant system which is cover all area of plant premises for handling fire & explosion hazard in case of emergency.

8.9.1 Hydrant System

A fire hydrant network system has been envisaged for the plant. Internal hydrants shall be provided at suitable locations in junction houses and cable galleries at different levels inside the major plant units. Yard hydrants shall be provided normally along the road and in the close vicinity of the units to meet the additional requirement of water for extinguishing fire.

8.9.2 Automatic Fire Detection and Alarm System

Unattended and vulnerable electrical premises like electrical control rooms, cable tunnels MCC, transformer rooms, MRS etc shall be provided with automatic fire detection and alarm systems. The emergency control centre would be sited in an area of minimum risk.
8.10. DISASTER MANAGEMENT PLAN

8.10.1 DEFINING THE NATURE OF EMERGENCY

LEVEL OF EMERGENCY CAN BE CLASSIFIED IN THREE CATEGORIES.

LEVEL - 1:
The incident or emergency which shall be confinable, controllable within the plant premises, which under normal circumstances does not affect area outside the said plant battery limit and Controlling does not involve / require external help. This situation is called emergency stand by and affected unit / plant has to handle emergency.

LEVEL - 2:
When the incident or emergency will not controlled within 10 to 15 minutes or does not come under control within 10 to 15 minutes, incident controller, site main controller reviews the situation and decides if situation is worsening.

a) Can affect other section of the same plant and necessitate shutdown of that sections.

b) And or Can affect other nearby plant / sections and necessitate shut down of that area.

c) And / Or affecting whole of premises and not outside the premises.

Then without delay declare On – Site Emergency and activate Siren as per code and give message to affected area for safe shut down.

LEVEL - 3:
After surveying Off – Site implications of level – 2 emergency if there is a likely hood of chlorine gas cloud formation and spreading of cloud in down wind direction affecting neighboring population of industry and villagers and / or in case of following incident IC and SMC are of the opinion that there will be Off – Site implications.

Raise level – 3 sirens and declare Off – Site emergency and activate as per Off – Site emergency plan.
8.10.2 OBSERVER

DUTIES OF OBSERVER

Any person noticing a fire or an unusual occurrence will contact the security personnel at the main gate and Plant Supervisor by:

1. Giving a telephone message
2. Sending message through a messenger
3. Rush personally

While giving the message, he will:

1. Identify himself
2. State briefly type of emergency
3. Location of Incident / accident
4. Severity of emergency

After giving message, he will return to the scene / area of emergency by taking all personnel protection measures, if possible & awaits instructions from Plant Supervisor (Incident Controller).

8.10.3 CHIEF EMERGENCY CONTROLLER

He will be Chief Manager in his absence; the Plant Supervisor will be the Chief Controller till any one of the designated Managers arrives at Site and assumes overall charge of the situation. His task will be to co-ordinate all internal and external activities from the Emergency Control Center at Main Security Gate from where all operations will be directed. He shall:

- Immediately on being informed of the emergency and its location, will arrive at the scene & handle the situation.
- Relieve the Incident Controller from responsible of the Main Controller.
- Co-ordinate to avail services from external agencies like fire brigade, hospitals etc, if called for, following the declaration of major emergency. If necessary, major installations in the vicinity may also be informed of the situation.
- Exercise direct operational control of the unaffected section of the plant.
- In consultation with the advisory team, expedite the shutting down of loading / unloading operations of tankers and if necessary, instruct the supervisor / security personnel to evacuate tankers.
Ensure that all employees are evacuated from the affected area and the casualties, if any, are given necessary medical attention. Instruct P & A Assistant / Security for rushing casualties to hospitals if required.

Liaise with fire and police officials, pollution control board officials and other statutory bodies and advise them of all possible consequence effects outside the premises.

Arrange for relief of personnel when emergency will prolonged.

Issue authorized statement or press release to the news – media.

Ensure preservation of evidence for enquiries to be conducted by statutory authorities.

Authorize the sounding of “All Clear” and “Evacuation Siren”.

Arrange for obtaining the head – count of all personnel within the premises and crosschecking with the data from records available for no. of persons within the premises.

Nominate a person from advisory team, to maintain chronological log of event during the entire period of emergency.

8.10.4 LIST SAFETY APPLIANCES:

INTERNAL SAFETY SURVEY:

It will be conducted by a task force specially formed to identify various hazards in plant areas. Checking of Personnel Protective Equipment's shall be done for its workability. Checking of various Safety installation/facilities available at site shall be done for its workability.

PERSONAL PROTECTIVE EQUIPMENT:

Adequate numbers of Personal Protective Equipments will be available and spare stocks are also kept. Workers shall be trained to use above PPE'S.

Helmets - Will be Issued to all
Safety shoes - Will be Issued to all
Safety goggles - Will be Issued to all
Face shield - Nos.
Hand gloves - pair
Apron, PVC suit - Nos.
Safety belts - Nos.
Ear plug/ear muff - Nos.

Required emergency safety appliances and PPEs shall be provided in emergency boxes in plants and ECC as per list.
8.11 STRUCTURE OF EMERGENCY MANAGEMENT SYSTEM

M/s. Nilkanth Concast Pvt. Ltd. shall develop an emergency management team. The management structure includes the following personnel’s;

- Chief Emergency Controller
- Incident Controllers and Deputy Incident Controllers
- Site Main Controllers
- Key Personnel’s
- Essential Workers
- Assembly points
- Emergency control center
- Fire control arrangements
- Medical arrangements
- Other arrangements

8.11.1 CHIEF EMERGENCY CONTROLLER

He will be Chief Manager in his absence, the Plant Supervisor will be the Chief Controller till any one of the designated Manager arrives at Site and assumes overall charge of the situation. His task will be to co-ordinate all internal and external activities from the Emergency Control Centre at Main Security Gate from where all operations will be directed. He shall:

1. Immediately on being informed of the emergency and its location, will arrive at the scene & handle the situation.
2. Relieve the Incident Controller from responsible of the Main Controller.
3. Co-ordinate to avail services from external agencies like fire brigade, hospitals etc, if called for, following the declaration of major emergency. If necessary, major installations in the vicinity may also be informed of the situation.
4. Exercise direct operational control of the unaffected section of the plant.
5. In consultation with the advisory team, expedite the shutting down of loading / unloading operations of tankers and if necessary, instruct the supervisor / security personnel to evacuate tankers.
6. Ensure that all employees are evacuated from the affected area and the casualties, if any, are given necessary medical attention. Instruct P & A Assistant / Security for rushing casualties to hospitals if required.

7. Liaise with fire and police officials, pollution control board officials and other statutory bodies and advise them of all possible consequence effects outside the premises.

8. Arrange for relief of personnel when emergency is prolonged.


10. Ensure preservation of evidence for enquiries to be conducted by statutory authorities.

11. Authorize the sounding of “All Clear” and “Evacuation Siren”.

12. Arrange for obtaining the head – count of all personnel within the premises and cross-checking with the data from records available for no. of persons within the premises.

13. Nominate a person from advisory team, to maintain chronological log of event during the entire period of emergency.

8.11.2 INCIDENT CONTROLLER AND DEPUTY INCIDENT CONTROLLER

His primary duties are to take charge at the scene of the incident. In the initial stage he may be required to take decisions involving the operation of the other plants or to stop or continue any process and to take technical decisions to control the incident. The deputy incident controller should take the charge of incident controller, if he is not available due to any reason. As our factory is running 24 hrs, so each plants shift in charge are being nominated as I.C (after 'G' Shift) and they will be always available in the shift and can take charge till the arrival of IC.

Responsibilities/Duties of Incident Controller and Deputy Incident Controller:

- He shall take charge at the scene of incident.
- He may be required to take decisions whether to stop or continue any Process and take a control the incident or to isolate affected area of the plant and simultaneously inform / consult senior officers as per requirement.
- He shall immediately assess the gravity of risk and alert panel and field operators to start controlling their respective section.
• After assessing the level of emergency likely to exist, he shall ad emergency. As per the assessment of risk, if necessary inform concerned Senior Officer to declare major emergency and active on-site/off site emergency plan accordingly. As Per the situation ensure that Site Main Controller (SMC) will be informed.
• He will work under the direction of the SMC, but till his arrival he may have to execute following responsibilities.
• Ensure that all the Key Personnel are called.
• Direct for evacuation of plant and areas likely to be affected by the emergency.
• He shall communicate to the SMC the type of outside help needed.
• He shall direct all emergency operations within the affected area with the following priorities.
• Personnel safety, including of surrounding community.
• **Minimum damage to Plant, Property and Environment.**
• Appropriate actions to minimize loss of Production and Material.
• Give information to the head of fire fighting and rescue team and other emergency services.
• Depending on the incident, instruct partial or total shut down, isolations, depressurization, Nitrogen purging, fire fighting, rescue operations.
• Instruct upstream/downstream units to take emergency shutdown /cutting off supply and other appropriate actions and emergency evacuation help etc.
• Direct for search of casualties.
• Evacuate non-essential workers/visitors/contractors to safe assembly points.
• Brief site main controller and keep him informed about the developments.
• Pressure evidences. This will be necessary for investigation for cause and concluding preventive measures.
• Send runners, if telephones are out of order.

**8.11.3 SITE MAIN CONTROLLER**
He will have an overall responsibility for directing operations & calling outside help from Emergency Control Centers. He is required to take decisions after consultation with the Senior Manager available at site.
The Shift Engineer of non-affected Plant will act as SMC till arrival of the designated SMC at Emergency Control Centre (ECC). Until the arrival of SMC, he may have to execute following responsibilities.

- As soon as he received the information or comes to know about the incident, he shall proceed to Emergency Control Room (Control Room) and shall take charge of the incident. If Control Room gets affected due to unfavorable wind direction, Fire Control Room shall be used as alternate Emergency Control Room.
- He has overall responsibility for directing emergency action, operation and calling outside help.
- He shall ensure that all the Key Personnel are called.
- He shall assess the gravity of situation with the help of Incident Controller (IC), Plant Manager and Key Personnel and after quickly assess the situation, shall find out the of emergency from Incident Controller (IC), and declare the emergency.
- Level-1: Emergency - may be handled within the plant premises.
- Level-2: Emergency - On Site Emergency plant shall be activated.
- Level-3: Emergency - Action to be taken to operate Off-Site Emergency Plan.
- He shall direct all emergency operations within the affected area with the following priorities.
  - Personnel safety, including of surrounding community.
  - Minimum damage to Plant, Property and Environment.
  - Appropriate actions to minimize loss of Production and Material.
  - He shall direct for evacuation of plant and areas likely to be affected by the emergency.
  - He shall continuously review and assess possible developments to determine most probable course of events and actions.
  - He shall assess the situation and ensure that whatever resources needed is made available and utilized in a co-ordinate manner.
  - He shall direct the safe shut down of plants in construction with incident controller and Key Personnel, if necessary.
  - He shall check that all non-essential workers, visitors, contractors are evacuated to safe assembly point sand head count is completed.
  - He shall give instructions to the Incident controllers, Fire fighting and Rescue teams.
- He shall, if necessary arrange for evacuation of neighboring population.
- He shall ensure that search for casualties, within the affected area has been carried out and arrange for hospitalization of victims and additional medical help, if required.
- He shall ensure that liaison will be made with outside agencies such as Police Services, Fire Services, Expert on Health and Safety, Meteorological Office, District Emergency Authorities, Collector and Senior Inspector of Factories. Provide advice on possible effects to areas outside the factory.
- He shall arrange for up to date records of emergencies.
- He shall advice not to re-start the plants unless it is declared safe to start by competent authorities.

8.11.4 KEY PERSONNELS

Key Personnel are required to provide and to implement the decisions made by the SMC in the light of information received on the developing situation at the time of emergency. As necessary, they will decide the actions needed to shutdown plants, evacuate personnel, carryout emergency engineering work, arrange for supplies of equipments, utilities, carryout environment monitoring, provide catering facilities, liaise with police, fire brigade and other local authorities, relative of casualties, hospital, press & neighboring industries. Action at assembly points, outside shelters and mutual aid center under the direction of the SMC. All the key personnel and other called in so to assist shall report to the ECC. They shall be available at any time on duty or on call or on oil duty or holiday.

8.11.5 ESSENTIAL WORKERS

A task force of essential trained workers (expert’s team) is available to get the work done by the Incident Controller and the Site Main Controller. Such work will include:
1) Fire fighting and spill control till a Fire Brigade takes the charge.
2) To help the Fire Brigade and mutual aid teams, if it is so required.
3) Shutting down plant and making it safe.
4) Emergency engineering work e.g. isolating equipment, material process, providing temporary by-pass lines, safe transfer of materials, urgent repairing or replacement, electrical work, etc.
5) Provision of emergency power, water, lighting, instruments, equipments, materials, etc.
6) Movement of equipment, special vehicle and transport to or from the scene of the accident.
7) Search, evacuation, rescue and welfare.
8) The injured is given First Aid.
9) Moving tankers or other vehicles from area of risk.
10) Carrying out atmospheric test and pollution control.
11) Manning of assembly points to record the arrival of evacuated personnel. Manning for outside shelters and welfare of evacuated persons there.
12) Assistance at causalities reception areas to record details of causalities.
13) Assistance at communication centers to handle outgoing and incoming calls and to act as messengers if necessary.
14) Manning of works entrances in liaison with the police to direct emergency vehicles entering the work, to control traffic leaving the works and to turn away or make alternative safe arrangements for visitors, contractors and other traffic arriving at the works.
15) Informing surrounding factories and the public as well as directed by the Site Main Controller.
16) Any special help required.

8.11.6 ASSEMBLY POINT
In affected & vulnerable plants, all nonessential workers (who are not assigned any emergency duty) are evacuating the area & report to a specified Assembly Points. Each assembly Point will be clearly marked by a Conspicuous notices & provided with an identification numbers e.g. Assembly Point No. 1, 2 and so on. Assembly Points are located at a safe place, well away from area of risk and least affected by the down wind direction. To ensure that workers do not have to approach the affected area to reach the Assembly Point proper location and numbers have been marked at Assembly Points. Each Assembly Point in manned by a nominated person to record the names and dept. Further telephone to communicated SMC has been provided at each assembly Points. At each Assembly Point duties of Assembly Point In-charge has been also displayed in brief Before reaching an Assembly Point or subsequently, if it is required to pass through an affected area or due to presence of toxic substances. Suitable PPE's including respirators, helmet etc., are issued & made available with workers.
8.11.7 EMERGENCY CONTROL CENTER

The Emergency Control Center (ECC) is the place or room from where the operations to handle the emergency are directed and coordinated. Main Control Room will be earmarked/identified as the Emergency Control Room. Fire Control Room shall be earmarked/identified as the alternative Emergency Control Room to be operated in case of unfavorable wind direction. Adequate Telecommunication System will be available in the Emergency Control Room i.e. Hot Lines, Intercom & External Phones.

The ECC center shall be equipped with the following facilities.
1. Internal and external telephone including STD facility
2. Telephone directory
3. Telephone nos. of mutual aid centers
4. Factory layout plan
5. Map of the area
6. Employee blood group and their address
7. Messengers / Runners for sending messages
8. Adequate numbers of PPE’S

8.11.8   FIRE CONTROL ARRANGEMENTS

8.11.8.1 FIRE FIGHTING, GAS LEAK CONTROL AND RESCUE OPERATION

A) Role of Manager (Fire and Safety) / Shift In-Charge (Fire & Safety)
1. Incident Controller will be the only person to direct the fire fighting and Emergency operation.
2. Keep the constant touch with the SMC / In charge - EHS.
3. Direct the crew members to the scene of emergency and arrange replenishment of Manpower / equipment / extinguishing media etc.

B) Role of EHS Representative:
1) On being notified about the location of fire/ gas leakage immediately proceed to the help.
2. Decide his line of action in consultation with Incident controller and take appropriate measures to handle the emergency.
3. Assessing the severity of the incident immediately report to emergency controller about the gravity of the situation.
4. He will assess the extra requirement required if any from the neighboring industry.
C) Fire crew members

1. On hearing fire alarm, emergency siren they shall immediately report to control room and proceed to the scene of emergency and work under the direction of IC/ Dy IC.
2. The personal availability at the scene of incident to be made optimize.

8.11.9 MEDICAL SERVICES

The roles of Medical officers are as follows;
(a) He will contact immediately to the SMC/IC.
(b) He will render necessary treatment, at Occupational Health Center.
(c) He will arrange for Hospitalization and Treatment at outside hospitals, if required.
(d) He will mobilize in getting the services of External medical agencies, other Para –medical services etc. and transportation services etc.
(e) He will arrange for extra medical assistance/antidotes, from out, if required.
(f) He will arrange for first-aid trained volunteers for necessary help.
(g) He will rise with the Government Health Authorities for treatment of the affected persons nearby.

8.11.10 OTHER ARRANGEMENTS

Other arrangements include external transport, cranes, generator sets to supply emergency power, environment monitoring equipment, rescue items etc. when available resources do not meet the requirement.

STANDARD OPERATING PROCEDURE (EMERGENCY)

• As soon as emergency alarm is heard, all essential workers shall report to IC or SMC.
• They shall carefully listen to the instructions given by IC or SMC
• According to the type of emergency/accident, they shall get equipped with PPE/Fire fighting equipment and devices.
• The runner among the workers shall inform SMC/IC and key personnel if they are not at site.
• The messenger amongst the workers shall deliver messages to nearby units as per the instructions of SMC/IC.
• The in-charge of medical arrangements shall prepare first-aid and other required facilities for the injured.
• The other essential workers shall try to control the emergency as per the instructions given to IC.
• IC would keep SMC informed about the status of control measures being taken at the site and ask for other requirements e.g. Mutual aid, equipment etc., if he find necessary.
• SMC would co-ordinate with outside agencies regarding control measures being taken, need for external help, evacuation, medical treatment etc.

8.11.11 COMMUNICATION SYSTEM
After the assessment of risk & their possible environmental impact and after making an organization for the preparedness to control the emergency, the next most essential step is to make us ready for Communication at the time of emergency. Communication System is a Crucial Factor while handling emergency.

Company will have quick & effective Communication System through which, any situation, which can lead to emergency, can be informed or known to.

i. All working inside the plant.
ii. Key Personnel outside during normal working hours & during off-duty hours.
iii. Outside emergency services, Statutory and Local Authorities and
iv. Neighboring facilities and public leaving in vicinity.

Each and every section, Plant & Department of the Factory shall be connected by internal telephones. External Phone at Office and Residence and Mobile shall be also available with Key Personnel and top executive of the factory. Hot lines shall be provided with mutual aid Partner through the Emergency Control Center. The Communication System begins with raising the alarm declaring the emergency, Telephone messages and Procedure to communicate the emergency to other persons & General Public.

8.11.11.1 RAISING THE ALARM
As soon as incident takes place inside the factory and is noticed by someone, the first step is to raise the nearest manual emergency bell to alert the nearby people. Next, he/she informs the security persons to raise the emergency siren located at the factory gate. The security personnel sound the siren, raising and lowering the sound three times in a 10 second “ON”, 5 second “OFF” sequence. All
the security employees shall be trained for operating the siren to announcing the emergency. In case of power failure, manual bell shall be also provided.

The alarm sound informs the I.C and the S.M.C that an emergency has been created and emergency organization is to be activated. The I.C. rushes to the site and takes charge of the scene.

**8.11.11.2 DECLARING THE MAJOR EMERGENCY**

Major emergency has to be declared after sufficient and through check because the declaration of major emergency puts many agencies on action and it may disturb the running system, which may be Costly at, time or its Consequence may be Serious. Therefore major emergency must not be decided on whims or immature judgment or without proper thought. Looking to all the above, we will have taken care to nominate the persons who can declare the emergency; we will have selected them on the basis of their knowledge & experience. These persons will be technically qualified and experienced. They shall advice the Incident Controller or Site Main Controller regarding the type of emergency. On being convinced, the Site Main Controller or Incident Controller shall declare an ON-SITE emergency. The decision about major emergency shall be taken as early as possible and without wasting time so that control action can be started immediately.

**8.11.11.3 TELEPHONE MESSAGES**

After hearing the emergency alarm and during emergency or even while just receiving the emergency message on phone, Telephone operator should be precise, sharp, attentive and quick in receiving and noting the message and subsequently effective in further Communication A form to record emergency telephone calls shall be available with telephone operator or Person available in Emergency Control Center, who has to record such calls during emergency. Telephonic messages shall be given out by the telephone operator to Site main Controller and key personnel as per the instructions of the Incident Controller. Telephonic messages shall also be given to authorities and external agencies to describe the type of emergency. All details of emergency shall be collected/delivered according to this format shall available with the telephone operator.
8.11.11.4 COMMUNICATION OF EMERGENCY & STATUTORY INFORMATION

8.11.11.4.1 COMMUNICATION OF EMERGENCY
An effective system to communicate emergency shall be available.

- Inside the factory i.e. workers including key personnel and essential workers, on duty & inside during normal working hours.
- To key personnel and essential workers not on duty and outside during normal working hours.
- To the outside emergency services and the Government authorities.
- To the neighboring factory & the General Public in the vicinity.

a) Information to Workers
All personnel inside the factory shall be informed by the sounding of the siren or in case of electricity by ringing the bell.

b) To key personnel outside during normal working hours
The key personnel outside the factory premises shall be informed as per the need by external telephones or runners.

c) To the outside Emergency Services and the Authorities
Once the emergency is declared, it is essential that the outside emergency services should be informed in the shortest possible time. Responsibilities shall be fixed as per the Incident/Emergency Command structure/plan to contact outside agencies for help and to communicate to the all the Government and other Authorities such as Fire Brigade, Police, District Emergency Authorities, Factory Inspectorate & Hospital etc. In case of major emergency, outside agencies like mutual aid, hospitals, policies, Factory Inspector, Collector, Fire-brigade etc. shall be informed by telephone or by sending special messenger from emergency control center.

d) To neighboring factories and the General Public
A major emergency will affect areas outside the works and it is essential that neighboring factory and General Public, should be informed to enable them to take prompt action to protect their own workers and to take whatever measures may be possible to prevent further escalation of the emergency due to effects on their own installations, at the same time, they may be able to provide assistance as part of a prearranged mutual aid plan. Further responsibilities shall be fixed to inform the neighboring factories and the General Public leaving in the vicinity. The neighboring units shall be informed about an emergency through external telephones or runners. The general public shall be
informed about an emergency using loudspeaker on scooter or rickshaw or car. Help from police shall be sought if required.

8.11.4.2 STATUTORY INFORMATION
a) Information to Workers
Set of Statutory information regarding types of hazards and their prevention and control as directed in the Factories Act shall be prepared by the unit. This information shall be printed in the local language and given in the form of booklet to all workers including contract workers.

b) To the outside emergency services and authorities
Statutory information in the form of booklet shall be given to outside emergency services and authorities.

c) To neighboring firms and the general public
Statutory information in the form of booklet will be given to neighboring units and the general public of the villages in the vicinity of the unit.

8.12.0 OFF–SITE EMERGENCY PLAN
8.12.1 NEED OF THE OFF–SITE EMERGENCY PLAN
An off-site emergency plan is prepared to deal with those incidents which have the potential to harm persons or the environment outside the boundary of the factory premises. A major accident, major emergency and disaster may affect areas outside the plant. An explosion can scatter debris over wide areas and its effects of blasts can cover considerable distances. Thus the events like these described above can affect outside areas and combating them needs an Off-site Emergency plan.
Envisaging such a rare incident, an off-site emergency plan should be drawn up for the following purpose.
1. To provide basic information about the risk and environmental impact assessment related to the unit to local / district authorities, police, fire-brigade, surrounding units, and the general public. To appraise them of consequences and the protection / prevention measures and control actions and to seek their help to communicate with public in case of a major emergency. The information from all industries shall enable district authorities to educate public about what could go wrong, and to train them of measures to be taken as an individual.
2. To enable district authorities to prepare the off-site emergency plan (contingency) for the district or particular area and to organize rehearsals and initiate actions learnt from these incidents.

Our Emergency Plan shall be made after considering the all possible effects of incidents on the neighboring population and the remedial measures will be devised in consultation with the local authorities and emergency services.

### 8.12.2 STRUCTURE OF THE OFF-SITE EMERGENCY PLAN

<table>
<thead>
<tr>
<th>IC</th>
<th>District Authorities</th>
<th>Mutual Aid teams, outside</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMC</td>
<td>(Collector, Factory</td>
<td>services, voluntary</td>
</tr>
<tr>
<td>Essential Workers</td>
<td>Inspector, Police)</td>
<td>organizations</td>
</tr>
<tr>
<td>(Implementing</td>
<td>Information, Evacuation</td>
<td>(Fire-fighting, Gas leak control, First-aid, Shelter,</td>
</tr>
<tr>
<td>Action plan,</td>
<td></td>
<td>Hospitalization,</td>
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<tr>
<td>Informing nearby</td>
<td></td>
<td>Transportation)</td>
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<tr>
<td>Public)</td>
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</tbody>
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### 8.12.3 ROLE OF FACTORY MANAGEMENT

The Off-Site emergency Plans are dovetail so that the emergency services shall be summoned at the appropriate time and shall be provided with accurate information and a correct assessment of the situation. The responsibility for this is with the Site Main Controller. The Site Main Controller shall provide a copy of our On-Site and Off-Site Emergency Plan to the District authorities, the Factories Inspectorate and the Emergency Services, so that on the basis of information and such authorities can make their emergency preparedness plan to formulate and execute the District / Area off Site Emergency Plan. Further on the advice of the authorities we can also modify our plan to make our plan more effective and perfect.

### 8.12.4 ROLE OF EMERGENCY CO-ORDINATION OFFICER (ECO)

The various emergency services will be co-ordinated by the Emergency Co-ordination officer (ECO), who will likely to be a Collector. The ECO will liaise closely with the Site Main Controller. The Emergency Control Centre of the factory can be utilized by the ECO to keep liaison with the Site Main Controller.
8.12.5 ROLE OF THE FIRE AUTHORITIES
The control of fire is normally the responsibility of the senior fire officer who would take over the handling of fire from the IC on arrival at the site.

- The senior fire brigade officer may also have similar responsibility for other events such as explosion releases. Fire authority having major hazard units in the area shall- Familiarize themselves with the location and site of all stages of flammable materials, water and foam supply points, firefighting equipment.
- Act as observer of an on-site exercise involving only site personnel

8.12.6 ROLE OF THE HEALTH AUTHORITIES
Health authorities, including Doctors, Surgeons, Hospitals, and Ambulances so on, have a vital part to play following a Major Accident and they should form an integral part of any emergency plan. In case of major fires, injuries will be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this type of injuries cases may be generally available in most of the 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.

8.12.7 ROLE OF TELEPHONE DEPARTMENT
The communication system between the factory and the various above role-playing authorities must be effective. The ineffective public telephone system will not be useful in emergency. Therefore, telephone department should maintain the phones and if required temporary telephone connection may be provided to various above authorities to deal the emergency.

8.12.8 ROLE OF POLICE AND EVACUATION AUTHORITIES
- To protect life and property
- To control traffic movement
- To inform people to remain indoors or evacuate
- To carry-out evacuation
- To identify dead, deal with casualties and inform relatives of dead or injured.

For evacuation, the following criteria are useful:
a) In case of major fire, only houses close to fire and in the direction of smoke need evacuation
b) If fire is escalating and in turn threatening a store of hazardous material, it is necessary to evacuate people nearby if time is available; otherwise they should be informed to keep themselves indoor and shield from the fire.

8.12.9 ROLE OF THE MUTUAL-AID AGENCIES
Mutual-aid arrangements shall be made in areas of fire control, medical and transport & evacuation. All partners of mutual-aid shall extend all possible help in these areas.

8.13 Do’s & Don’t of preventive maintenance, strengthening of HSE, manufacturing utility staff for safety related measures

DO’s and DON’Ts for Safer Operation

Do’s:
• Use lubricating oil carefully to avoid spillage on ground.
• Use lubricating oil as per requirement.
• Use minimum amount of water wherever it is required as per plant guidelines.
• Waste disposal system for all plants should be separate.
• Use cleaning equipment carefully. (i.e. cotton waste, oil & chemicals)
• Place all the equipments (i.e. Fire Hose, Rubber Pipe and Chisel) at proper place.
• Safety training and correct use of PPE’s must for all the employees.
• In case of fire or any accident, immediately inform responsible person,
• In case of emergency, inform operator as well as control room.
• Area of work during excavation, radiography, sand blasting shall be cordoned with warning tags of “work in progress”, “no entry”, “radiography” in progress' etc.
• Switch off lights and computers when not in use.
• Shut the water cock properly when not in use.
• Always follow safety rule during the plant operation.

Do’s during shut down:
• All equipment, vessels, lines where hot work is envisaged shall be purged, flushed thoroughly and positively isolated. Similar precautions should be taken for vessel entry also.
• Back flow of materials from sewers, drains should be avoided by proper isolations.
• In case of confined space entry and other cleaning, catalyst removal, sludge removal jobs etc. which are to be carried out by the process department, vessel entry permit should be issued to immediate supervising officer/operator by shift in charge. This permit should be renewed by incoming shift in charge during every shift.
• Hoist, Platform, cages used for lifting persons or to send persons inside vessels by such means must be of sound construction with wire ropes slings, etc. to avoid failure.
- All steam, condensate, hot water connections should be made tight with clamps.
- All underground sewers shall be flushed, protected from sparks.
- Full PPEs like PVC suits, gum boots, face shield & other required shall be used while draining, flushing and other reclaiming activities to avoid burn, poisoning etc.
- Wet asbestos cloth/metallic plate should be used to collect flying sparks.
- Water, steam flushing, nitrogen blanketing shall be continued where spontaneous combustion takes place. Precautions should be taken for pyrophoric nature of material.
- Temporary electrical connections, cords, boards and other electrical fixtures should be of sound material to prevent electrical shock.
- Proper approach like aluminum ladder should be provided to reach to the platforms of scaffolding and ladder must be tied.
- All clumps of scaffolding should be tightened properly and planks should be tied at both ends and supported at proper distances along span to avoid sagging and failure.
- Always use safety belt while working at height of more than 2 meters and ensure tying the life line of safety belt with firm support.
- Ensure area cordonning for hot work, X-ray, excavation, hazard material temporary storage.
- Ensure proper tagging of valves, switches etc to prevent its use.
- Ensure proper guidance to workman and make him aware about local area hazards before start of the job.
- All welding machines should be provided with power isolation switch of suitable rating.
- Portable electrical appliances/tools earthing should be in good working condition. Insulation portion should be free from damages.
- All electrical cables should be joints free and connection taken by using three pin plugs.
- While inserting fuse all care should be taken so that no one touches conductor to avoid the shock to the persons.
- During hydro jetting work workers should wear hand gloves, safety helmet goggles and PVC suit.

**Don’ts:**
- Do not use fire hydrant water for washing/bath purpose.
- Do not use water for cleaning purpose, use broomstick if possible.
- Do not wash or clean trolley, tractor or trucks which are used for transportation. Wash them at proper place.
- Smoking & carrying matchbox, cigarettes, lighter, bidis etc. are prohibited.
- Photography & carrying cameras/Mobile phones are strictly prohibited in all areas.
- Do not spill liquid or chemicals in open atmosphere.
- The use of Radio Active Source within the plant shall not be allowed without obtaining valid permission/work permit and intimation in the form of a circular to all plant persons shall be given in advance.
- Unauthorized entry into any battery limit of plant is strictly prohibited.
• Sitting or walking on rail tracks, crossing between wagons, taking rest under stabled wagons, crossing the rail through the openings underneath the stationary wagons are strictly prohibited.

**Don’ts during shut down:**
- Do not use gasket or other blinds as it can fail during job. All blinds should be metallic.
- No toxic/corrosive/irritating materials should remain plants or sections where hot work is to be carried out.
- No hot work should be permitted in battery limits near sewers till areas have been cleaned flushed properly.
- No hot work irrespective of place of area shall be done without valid permit.
- No combustible material shall be there in flare line for taking up of flare line job. Isolations shall be ensured.