Risk Assessment & Disaster Management Plan

Risk Assessment & Damage Control

Risk assessment is the determination of quantitative and qualitative value of risk related to a concrete situation and a recognized threat.

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

Hazard Identification and Risk Assessment (HIRA)

The cement manufacturing industry is labor intensive and uses large scale and potentially hazardous manufacturing processes. The industry experiences accident rates that are high compared with some other manufacturing industries. Following hazards may occur in grinding unit:-

i. Physical hazards
ii. Loading/Unloading/Packaging operations
iii. Raw material/product storage area
iv. Cleaning operations
v. Electrocution/electrical hazards

These mainly impact on those working within the industry, although health hazards can also impact on local communities.

Identification of sources of Fire

i) Oil and lubricant room
ii) Diesel Pump/storage area
iii) Electrical faults

Maximum Credible Accident Scenario Analysis

Physical hazards

Injuries during project operation are typically related to slips, trips and fall; contact with falling/moving objects and lifting/ over- exertion. Other injuries may occur due to contact with or capture in operating machinery. Activities related to maintenance of equipment, including crushers, mills, mill separators, fans and belt conveyors; represent a significant source of exposure to physical hazards. Such hazards may include the following:

- Falling / impact with objects
- Transportation.

Loading/Unloading operation/ Storage

- Movement of heavy good vehicles for unloading material
- Work inside hopper/Silo for unblocking of mouth
- Excessive dust during loading/unloading operation
- Conveyor moving parts
- Cleaning of spread outs
- Unauthorized passages, travelling over transportation system
- Unclean platforms causing staggering and falls.

Cement mills (Grinding unit)

- Failure of rotating parts of machinery
- Fall of material from height in case where protection ducting is blocked
- Hurling of mill(shell) parts
- Exposure to Noise & Dust
- Work Environment without sufficient ventilation
- Hurling of dust or coming into contact with hot material
- Manual handling of loads
- Getting hit crushed or trapped by machinery.

Silo cleaning operation

- Work in confined spaces may lead to suffocation.
- Falling of material can lead to an accident.
- Falling of personal from working platform
- Exposure to dust & Heat
- Use of lifting equipment
- Use of hand held work equipment during cleaning.

Electrical Hazard due to Dust

- Electrical equipment such as motors, circuit breakers, transformers, and switchgear can produce sparks and ignite dust clouds and hybrid dust/air mixtures in the vicinity. Reference is taken from CCPS Guidelines for safe handling of Bulk solids.
- Entry of dust into enclosures with subsequent ignition causes smouldering or burning.
- Dust that enters an enclosure will settle out as layers on internal surfaces and become heated.

- Electrically conductive dusts cause short-circuiting when deposited on exposed electrical components and circuits.
- Abrasive and/or corrosive dusts damages components of electrical equipment

Flood, Earthquake and Other Natural Calamities

- In case of a land slide, earthquake or any other natural calamity, the Emergency Controller will immediately inform the process in charge/ director who will contact the Local Municipal. Administration, Fire brigade and police for remedial actions.
- The staff on duty or other personnel as given under plant personnel emergency notification list will be called for alertness.
- Emergency vehicles will be kept ready.
- Supervisor/ Incharge of the site will be alerted.

Rain and Storm

Process in charge/shift in charge will take the following actions in case of storm:

- See that all the Electrical Inventories and Machines are properly placed and away from the contact from water.
- See that all the machines/material at height which is in the rigging process is grounded.
- All the workers working at height are grounded.
- In case people are trapped at site for long hour appropriate facilities to be provided by the service provider.
- If necessary, head count to be initiated to see that someone is not missing.
- All loose, light objects will be removed from the site, which could become hazardous missiles during high winds.
- Buckets, ladders, maintenance materials etc are to be placed in the safe place.
- Hydra, trucks, welding machines, etc. are to be placed at safe positions / places.
- All construction materials i.e. beams, pipes, power equipments etc. which cannot be moved to a safe location, are to be latched in place in the best possible manner known.

Riot or Civil Disturbances Procedure or Bomb Threat or Terrorist Attack

If there are persons, on or near company property with the suspected intent of causing damage to the property, injury to the plant personnel, disruption of normal operations, etc. The information will be given to Director of the company and the following steps will be taken:

- Local police station will be informed, if required.
- The staff on duty or other personnel as given under plant personnel emergency notification list will be called for alertness.
- In charge/ Director will instruct to the security to close and lock all the site entry gates.
- It will be ensured that no unauthorized person is allowed access to the site without proper identification.
- Emergency vehicles will be kept ready.

Mitigation Measures

Following management measures are already implemented and will be continued to prevent the physical hazards in the plant:

- Work Permit system to ensure proper management control on the hazardous work activities like Maintenance Work required energy isolation, Work in Confined Space, Lifting & supporting loads, Work at Height and Earth Excavation.
- Any person working on equipment with moving parts is personally ensured that the equipment is de-energized, isolated and locked/tagged out.
- Any person working from a position with the potential risk for a fall from height has to use fall protection.
- Any person doing flame welding, cutting or brazing in the proximity of any flammable material has to use standard hot work equipments.
- Prescribed PPE are provided to all workers exposed to open processes or systems.
- In case of any accident, immediate & proper medical care's are being provided at the plant site and nearby hospital and nursing home.
- To minimize traffic hazard, unidirectional vehicular movement will be implemented for the proposed expansion.

DISASTER MANAGEMENT PLAN

Onsite & Offsite Disaster Management & Emergency Plan

The Disaster Management Plan (DMP) has been chalked out to address the onsite and offsite emergency plan. The plan is based on the hazards enumerated in Risk assessment. The DMP addresses the range of mechanical, electrical and dust impacts so as to reduce the potential harm to people onsite & offsite, plant and the environment to a practicable minimum level. The plant is already operational and DMP is based on the past experience.

The capability of DMP will be to intercept full range of specific hazards to plant. Combat fires due to electricity, sudden generation of dust from process failure, evacuate people to safe locations to prevent irreversible injury.

The most important capability of DMP will be required speed of response to intercept a developing emergency so as to prevent the occurrence of disaster.

Philosophy of Disaster Control:-

The accepted principle of 'Prevention' of indentified hazard is the Philosophy behind the Disaster Control. Since, these hazards occur only when containment is failed, the key objective is technology selection, project engineering, construction, commissioning & operation generally referred to as consistent quality assurance. The management is committed to follow the same in letter and spirit.

DMP is prepared in consonance with MoEF&CC guideline and EPA-1986 titled "The Chemical Accidents (Emergency Planning, Preparedness and Response Rules, 1996)" wherein the Occupier of facility is totally responsible for the development of onsite emergency.

However, the offsite emergency plan should be developed by State Govt. through Deputy Commissioner.

Onsite Emergency Plan:-

Hence, the maximum use of combined resources of industry and outside resources is made in order to:

- Arrange rescue and treatment of affected person
- Safeguard others in plant premises
- Render all possible help to relatives
- Provide authorative information to media
- Preserve relevant records
- Contain and bring the incident under control
- Secure and safe rehabilitation of affected area

Action Plan:-

The action plan includes:-

- Declaration of emergency by identified key personnel defined having defined responsibility.
- Emergency control centers and assembly point locations.
- All clear signal mechanisms.
- Assigning duties to non-key personnel during emergency.

Key Personnel & their duties:-

The key personnel are nominated from within the industry having identity and duties as under:-

Site Controller: - is as sufficiently experienced operation officer and is authorized to take all decisions.

Incident Controller: - is assigned the job to direct operations during emergency and coordinating with outside agencies. A senior operation officer is generally assigned the job.

Liaison & Communication Officer: - mainly from HR department, liaison and communication officer remains stationed at the main gate of factory to handle police, press and other enquiries and also in touch with the Incident controller.

Fire & Safety Officer: - is responsible for fire fighting and communicate with all the above personnel through telephone, messages and public address system. He will provide access to the site incident.

Team Leaders: - for special activities to be carried out during emergency following teams each headed by a team leader are constituted for following purposes;

- Repair team
- Communication team
- Safety team
- Fire-fighting team
- Medical team &
- Security team

Mutual Aid:-

As all the factories are not equipped with exhaustive stock of services to meet the emergency, it is in the fitness of things to pool the overall resources with nearest outside agencies/factories during an emergency for which a formal mutual aid scheme must be made. It is written document mutually agreed upon all concerned industries.

Mock Drills:

To ascertain the efficacy of emergency procedure it is put to test through a mock drill by creating a similar emergency by conducting full scale rehearsal. During the mock drill the following are checked for effectiveness:

- Communication system
- Mobilization of teams
- Search, rescue & treatment of causalities
- Emergency isolation & shut down
- The plan is periodically reviewed for updation if any.
- All the measures for onsite emergency are in place in the existing unit.

Off site emergency Plan:

The measures to be adopted if effects of accident/disaster inside the factory are felt outside are called off site emergency plan and the same is documented in advance in consultation with District Administration which is ultimately responsible for the management of offsite emergency.

The Deputy Commissioner is assisted by all concerned departments and services. The core group such an eventuality is called **District Crisis Management Group** comprising the following members:

- Deputy Commissioner
- Senior Supernatant of police
- Municipal Commissioner/Sarpanch
- District Health officer
- Regional Officer from State Pollution Control Board

- District Agricultural Officer
- Inspector of Factories

The Site Controller and the Incident Controller of onsite emergency will communicate with Crisis Management Group during offsite emergency.

Emergency Planning for Natural Disasters:

Natural disasters such as earthquakes, floods, tsunami and cyclones can occur anywhere & anytime. Punjab in general and Bathinda in particular have not faced such situations in past more than 50 years as per the available records. As Bathinda has undergone transformation during the past two decades, the chances of storms & cyclones are now a matter of the past. Further, the project site is not liable to floods & no flood prone area exists nearby.

OCCUPATIONAL HEALTH AND SAFETY

The main areas of concern for ensuring adequate occupational health and safety are:-

- All working places will have safe means of access, safe working platform and exit. Persons working in hazardous dust prone area will be provided with dust mask.
- Personal Protective Equipments like respirators, ear plug, noise muff, helmet etc. will be provided to the workers.
- Proper unit design and engineering controls in order to protect workers, including by control of process and fugitive emissions.
- Adequate arrangement of drinking water will be done.
- Education & training will be provided to the workforce about facilities, protective equipment, risk associated, potential health effects, etc.
- Display board will be provided showing the hazards associated and recommended precautionary measures.

MAINTENANCE, EXAMINATION AND TESTING OF DUST CONTROL MEASURES

Irrespective of the type of dust control systems used, maintenance of the equipment in good working order is necessary to achieve low dust levels. Maintenance of dust equipment shall not be the responsibility of management alone, but of everyone.

- Any dust control measures provided will be maintained in an efficient working condition.
- There will be a thorough examination and testing of all engineering controls and suitable records maintained.

EMPLOYEE INVOLVEMENT AND COMMITMENT TO THE DUST PREVENTION PROGRAMME

- The involvement and commitment of employees in the dust prevention programme is critical.
- Employees will be encouraged to participate actively and in a positive manner in all pollutant control activities.
- The results of any dust survey shall be made available to all employees.
- The results and recommendations from such surveys shall be discussed at the relevant health and safety meetings.

EMPLOYEE EDUCATION AND TRAINING

It is a legal requirement for an employer to provide health and safety training. No worker can be expected to assist in making a control programme effective if he/she does not know the reasons for it in the first instance. It is important that employees know about dust and how to control their exposure. Their training and education should cover the following:-

- The health effects of exposure to dust.
- The importance of effective controls, safe work practices, and personal hygiene.
- The importance of airborne dust monitoring and how to interpret the results obtained.
- The importance of medical surveillance.
- How to use and care for personal respiratory protective equipment.
- Information on the health effects of smoking in exacerbating lung damage

- The early symptoms and signs of active tuberculosis (TB), which is a potential complication of silica exposure.
- Refresher training and additional training as appropriate for health and safety personnel involved with dust prevention.

ADMINISTRATIVE CONTROL

Proper procedures will be followed to control hazards at workplace

Written procedures for dust control

The written procedure specifies the following:-

- ✓ Description of the plant process identified in the risk assessment as sources of airborne dust.
- ✓ Details of the equipment provided to control and collect dust emissions.
- ✓ The requirement and design of ventilation system.
- ✓ The systems of work to be adopted to eliminate or reduce the need for workers to go into hazardous areas close to downstream of dust sources.
- ✓ Arrangements for supervision and maintenance of control measures.
- ✓ The details of respiratory protective equipment (RPE).

Removal of personnel

- This is an important method of reducing employee exposure to airborne dust.
- Procedures to ensure that no employee will be directly exposed to associated dust.

Hygiene facilities

It will be ensured that proper washing facilities are in place. All other facilities required for personal hygiene shall be adequately provided.

PERIODIC MEDICAL SURVEILLANCE OF EMPLOYEES

A medical surveillance programme includes medical and work history tracking, regular physical examinations, chest x-rays and lung function tests. Participating in a medical surveillance programme will help in the early detection of dust related disorder like Silicosis.

AUDITING OF OCCUPATIONAL HEALTH & SAFETY PROGRAMME

The purpose of an audit is to ascertain the efficacy of occupational health programme to verify their effectiveness for preventing occupational disease and to ensure compliance with company and statutory regulations. In addition, an audit must verify that the programme documentation withstand third-party scrutiny.

- Conduct an initial audit to define the current status of the dust prevention programme, to outline problem areas, to check documentation and to provide a baseline to document progress.
- Rectify problem areas that may arise.
- Ensure the provision of proper documentation.
- Conduct periodic audits of the dust prevention programme.

Medical surveillance

Following medical examination is being/will be conducted for all employees:-

- Pre-employment medical check-up.
- Pulmonary Function Test
- Complete Physical Examination
- Blood Test
- Urine Test
- Chest X ray

The frequency of medical examination is/will be twice a year and records maintained.

Preventive aspects	Commitments
Medical appliances & arrangements – A first – aid room with first – aid boxes,	Facilities will be provided at the mine site.
Conveyance arrangements to hospitals or dispensaries.	At the Mine site
Safeguards – All protective and safety equipments, helmets, face masks, gloves, ear muffs and goggles.	PPE's will be provided to the individual work persons and stock will be kept in store.
Medical Examination – IME of every	Doctors and the medical facility will be provided for regular check-up, documentation and records.
PME will be arranged in every five years and early in case of targeted groups like driller's/ operators and	
Health camps	Provided six monthly
Awareness Programme	Provided six monthly
Provisions for emergencies.	For treatment in emergencies in local/ external medical facilities