

Chapter 6.0 Risk Assessment and Disaster Management Plan

6.0 Introduction (Terms of Reference: 7 (ix))

The proposed stand alone cement grinding mill has mainly storage of raw materials, i.e., clinker, gypsum and flyash, grinding activity in 20 TPH grinding mill and a packing machine to produce 300 TPD of PPC/OPC cement. The process does not involve any chemicals or pyroprocess and involves physical activity of grinding alone. The project site is located at survey number 69-3, 69-4, Pachanapalli village, Chittoor Mandal and District, Andhra Pradesh spread over an area of 1.41 ha. The site is located adjacent to a two lane district road connecting Chillapalli - Narasingarayanipeta villages. The risk assessment involves identification of hazards which have a high probability of occurrence and evolve a management plan, delineating the mitigation/control measures to be adopted, facilities required and the responsibility of various employees.

6.1 Risk Assessment

The proposed activity involves mainly transport of raw materials and product, storage of raw materials and products, transfer of raw materials and products, grinding of raw materials and packing of cement in bags. The activity does not involve any chemical reaction and or combustion, and mainly involves pulverising and blending raw materials.

6.1.1 Hazard Identification

The hazards anticipated in the proposed plant are mainly related to exposure to dust and noise. The sources of these hazards are activities of storage, transfer, milling and packing. The potential health effect of dust exposure and noise exposure are described as follows;

Dust Exposure

The ACGIH prescribed a TLV value of 10 mg/m³ for dust exposure. The health effects due to the exposure to cement dust or gypsum dust are mentioned in the following paragraphs.

Eye Contact

Air born dust may cause immediate or delayed irritation or inflammation. Eye contact with large amounts of clinker dust and dry cement powder can cause moderate eye irritation, chemical burns and blindness. Eye contact with large amounts of gypsum can cause moderate eye irritation, redness, and abrasions. Eye exposures require immediate first aid and medical attention to prevent significant damage to the eye.

Skin Contact

Dust of clinker, gypsum and cement may cause dry skin, discomfort, irritation, severe burns and dermatitis. Clinker dust and cement dust are capable of causing dermatitis by irritation. Skin affected by dermatitis may include symptoms such as, redness, itching, rash, scaling and cracking. Irritant dermatitis is caused by the physical properties of clinker dust including alkalinity and abrasion.

Inhalation (acute)

Breathing dust may cause nose, throat or lung irritation, including choking, depending on the degree of exposure. Inhalation of high levels of dust can cause chemical burns to the nose, throat and lungs.

Inhalation (chronic)

Risk of injury depends on duration and level of exposure. This product contains crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica from this product can cause silicosis, a seriously disabling and fatal lung disease. Some studies show that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders such as scleroderma (thickening of the skin), systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. Silicosis increases the risk of tuberculosis.

Ingestion

Internal discomfort or ill effects are possible if large quantities are swallowed.

Noise Exposure

The sources of noise generation are transport, transfer, grinding, and packing activity. The continuous exposure to high noise levels may lead to annoyance, sleep disturbance, hearing impairment, ischemic heart disease, Hypertension.

The activities that result in the above mentioned hazards in this plant are described along with the mitigation measures of engineering controls, work practices, occupational safety measures are described in the following paragraphs.

Material transfer and storage

The exposure to air borne dust in the material transfer and storage areas results in breathing problems to operators and employees. The mitigation plan is to provide personal protective equipment.

Table 6.1 provides the hazards and the possible risks due to occurrence of incidents and proposed safety and mitigation measures.

Table 6.1 Hazards and Mitigation Measures

Hazard	Risk/effect	Safety/Mitigation measure
Air borne dust in storage area	Breathing problems	PPE, dust extraction system
Conveyor moving parts	Entrapment resulting in injuries	Provision of guard along the sides
Use of unauthorized passage	Injury	Restricted entry, safety signage
Maintenance during operations by unauthorized persons	Injury	Use of authorized personnel and supervision
Falling material	Injury	Adequate machine guarding
Operator falling from height	Injury	
Work in confined spaces during the repair of the mill inner walls or the replacement of the milling balls	Injury	PPE and supervision
In the milling areas due to the crushing of material inside the mill and due to the operation of the ball mill.	Gradual hearing impairment	Minimise noise at source or isolate noise. PPEs. Secure the doors of the ball mill room

6.2 Disaster Management Plan

The hazards identified in the proposed stand alone cement grinding mill are mainly physical hazards related to work practices, and process operations resulting in dust inhalation and exposure to noise levels. The plant is a small capacity mill with a total of 22 employees, and hence a disaster management plan is made brief. The plant head shall maintain a list of contact phone numbers of all personnel to be contacted during emergency, which include fire station, police station, factories inspector and revenue authorities. Workers will be trained on mitigation measures and operational practices for various hazards identified periodically preferable once in 3 months. An agreement with 108 emergency ambulances will be made to evacuate personnel in case of injury to the nearest hospital in Chittoor.

Resources

The following resources shall be made available to respond immediately to any emergency; communication system with alarm facility, personal protective equipment, fire fighting facilities like sand buckets, first aid kit.

Role and Responsibility of personnel

The managing director of the company shall be the site main controller, who will coordinate with both incident controller and site main controller who would decide on the type of emergency and the measures to be adopted, to direct safe closer of the unit, to coordinate with district authorities, to take final decision on closure or evacuation in case of a major incident.

The plant head shall be the site main controller. He will be responsible for arriving at the site of incident, take charge of the scene of the incident, assess emergency, act as incident controller in the absence of plant head, direct the shutdown of the plant, guide the employees to the assembly point, and adopt any measure to ensure safety of personnel, minimize loss of material and minimize damage to men, material and property of the unit, apart from consulting and briefing the incident controller.

The senior most technical person after plant head shall be the incident controller wherein the on receipt of information of any incident, he would assess the condition, classify the emergency, initiate mitigation and or recovery measures, evacuate the injured if any to the hospital, informing the authorities, ensuring recovery of the plant for re entry.

The other workers are responsible to intimate the emergency to incident controller. The other workers shall be trained in providing first air, assisting in evacuating employees, and assisting the external aid teams.