# RISK ASSESSMENT

## ENVIRONMENTAL RISK ASSESSMENT

It is a systematic approach for identification, evaluation, mitigation and control of hazards that could occur as a result of failures in process, procedures, or equipment. To avoid loss of life & property, public scrutiny and to meet the statutory requirements there is need to ensure that risk and hazard management study is conducted and implemented. Risk Assessment associated to CETP unit depends upon frequency and consequence of plant failure.

## OBJECTIVES OF RISK ASSESSMENT

The risk assessment study has been undertaken to address the following aspects:

- To identify the sources of hazard
- To identify the areas of safety
- To identify the generation and handling of hazardous materials
- To identify the potential of failure cases with significant effects.
- To estimate the probability of the occurrence of hazardous events.
- To adopt mitigation measures based on risk and reliability approach and engineering controls
- Occupational safety.

**The risk assessment broadly includes**

- ❖ Identification of hazards
- ❖ Prevention and control of hazards

## TERMS ENVIRONMENTAL RISK

- **Harm**: Damage to person, property or environment
- **Risk**: The probability of harm or likelihood of harmful occurrence and its severity. Environmental risk is a measure of the potential threats to the environment, life and property.
- **Consequence**: Effect due to occurrence of the event which may endanger the environment permanently or temporarily and, or, loss of life and property.

## IDENTIFICATION OF HAZARDS

### Fire and Explosion Hazard

Fire and explosion can be there due to improper ventilation for discharge of gases generated during treatment, short circuit or failure of electrical equipment's. Therefore, special precautions shall be taken to prevent fire and explosion events.

### Chemical Hazards

Sources of chemical hazards are due to Exposure of man and environment to chemicals and Toxic effects of chemicals.

### Electricity

Fatalities can arise due to electric shocks, burns and when contacted with overheads or underground power cables.

### Toxic Gaseous Hazards

The toxic gases as methane and hydrogen sulfide are the concern in wastewater treatment plants. Hydrogen sulfide and methane are the byproducts of the decomposition of organic materials that exist in the waste flows feeding the plant. The buildup of these gases may lead to lack of oxygen, or in some cases, explosion when coupled with a source of ignition. Beyond this, the dangers also exist from purifying chemicals such as ozone used as decontamination of the waste/ effluent water. The potential for an unlimited number of toxic or explosive gases exists from the chemicals that may be spilled or dumped into the waste system from the industrial community.

### Health Hazards

Volatile organics coming from various industries in wastewater vaporize or air-stripped during CETP operation can lead to different health hazards. CETP workers generally report vomiting, nausea, upset stomach and diarrhea like symptoms. Oxygen deficiency may occur in closed unventilated vessels. Loud noise from blowers can cause permanent ear damage

### Slips, trips and falls at work

These are the most common causes of non-fatal injuries at work but may cost workers heavily. Injury can be caused by rotating equipment such as pumps, blowers and fans. Falling from or into tanks and elevated platforms.

**PREVENTION AND CONTROL OF HAZARDS**

The risk management measures for the project activities require adoption of best safety practices. In addition, the design and engineering of the facilities would take into consideration protection measures for air and water environment.

- Administrative control- Rotation of personnel between treatment operations can reduce inhalation of air-stripped chemicals and aerosols, and may help the development of immunity to diseases by keeping exposure at low.
- Engineering control- Manage ventilation for processes located within the building, splash guards for dewatering equipment and design to reduce air-stripping and aerosols.
- Plant trees around the project boundary to capture the droplets and particles.
- Reduce air-stripping and aerosols by using diffused aeration rather than mechanical aeration and by using finer bubbles for aeration.
- Consider suppressing the droplets just above the surface by using water spray and disinfection of the airborne particles by using ultraviolet lights.
- Cover the primary clarification process unit to shield it from wind or use submerged effluent collectors, such as pipes with orifices, rather than weirs.
- Avoid handling screenings by hand to prevent injuries.
- Label piping so that potable and no potable water will be clearly distinguished.
- Use processes that significantly reduce pathogens as aerobic / anaerobic digestion, air drying, low temperature composting, lime stabilization.
- Make sure fans or blowers are on when you inspect the vessel.
- Worker exposure can be reduced by proper use of protective clothing and personal protective equipment.
- Physical injuries can be avoided by use of ladders, handrails, hard hats etc.
- Heavy-duty rubber gloves and boots can be used to prevent skin contact with wastewater and sludge.
- Remove contaminated clothing, after job completion.
- Shower at work and change into clean clothes and shoes.
- Wash hands with soap and water before eating or smoking and whenever hands contact wastewater and sludge. Care for cuts and abrasions promptly.
- Implementation of Material Data Sheets (MSDS) for all the chemicals used in the workplace.
- Instructions on labels and MSDS for workers in routine use.

- ❖ Use of PPEs by workers during working hours. Personnel need to wear proper ear protecting devices whenever working in noisy areas.
- ❖ Toxic or suffocating Gases or Vapors come from chemicals used in treatment processes or the treatment itself and all personnel should be trained in ways to handle it and should be trained in the use of self- contained breathing apparatus.
- ❖ Workers' rights to refuse the use of chemicals with no safety information about the chemicals. An emergency shower and eye wash should be located at the plant for washing out hazardous chemicals on the skin and eyes. Neutralizing solutions, proper equipment and clothing should be available for safety reasons.
- ❖ Regular survey of worker's health.
- ❖ Avoid accumulation of flammable material and store any material of this type at proper locations. Note the location of firefighting equipment.
- ❖ Recommendations to control the electricity hazards are listed below:
  - ✓ Use of safe and suitable equipment's
  - ✓ Safe installation of electrical appliances
  - ✓ Provision of safety devices for detecting faults
  - ✓ Overhead power lines
  - ✓ Safe working conditions
  - ✓ Do not attempt to repair electrical equipment's. Call an electrical repair technician.
- ❖ The risk associated with slip and trip hazards can be reduced by providing following measures:
  - ✓ Providing safety railing / grills, and safety stairs.
  - ✓ Providing Safety operating procedure for tank cleaning, maintenance work at depth or height, chemical handling, and doing regular maintenance work.

**CONCLUSION**

Risk assessment and hazard management study for CETP covered the risk assessment as well as identification of hazards. Further, prevention and control of identified hazards have been covered.

**REHABILITATION AND RESETTLEMENT (R&R) PLAN**

The industrial site is located in the designated place in the Industrial Focal Point of JKSIDCO. Hence, Resettlement & Rehabilitation is not applicable as there is no land acquisition or displacement of any houses, habitation or livestock.