

# MODULE 5

## CIVIL ENGINEERING

CHAITHRA B.R



**SJB**  
**INSTITUTE OF TECHNOLOGY**



## CHAPTER 1

# Untitled



Occupational Health and Safety Considerations: Water and wastewater treatment plants, Handling of chemical and safety measures in water and wastewater treatment plants and labs, Construction material manufacturing industries like cement plants, RMC Plants, precast plants and construction sites. Policies, roles and responsibilities of workers, managers and supervisors

# OCCUPATION HEALTH AND SAFETY CONSIDERTIONS

**Figure 1.1** AERIAL VIEW OF A WASTEWATER TREATMENT FACILITY



## What is dangerous about this job?

Wastewater treatment plant operators are exposed to a variety of hazardous chemical agents, contained within the effluents and the reagents used in the water processing, or generated during the water treatment.

- These chemical agents may cause acute poisoning, chemical accidents (e.g., skin burns, injury to the eyes, etc.)

damage to the respiratory system, allergies, dermatitis, chronic diseases, etc.

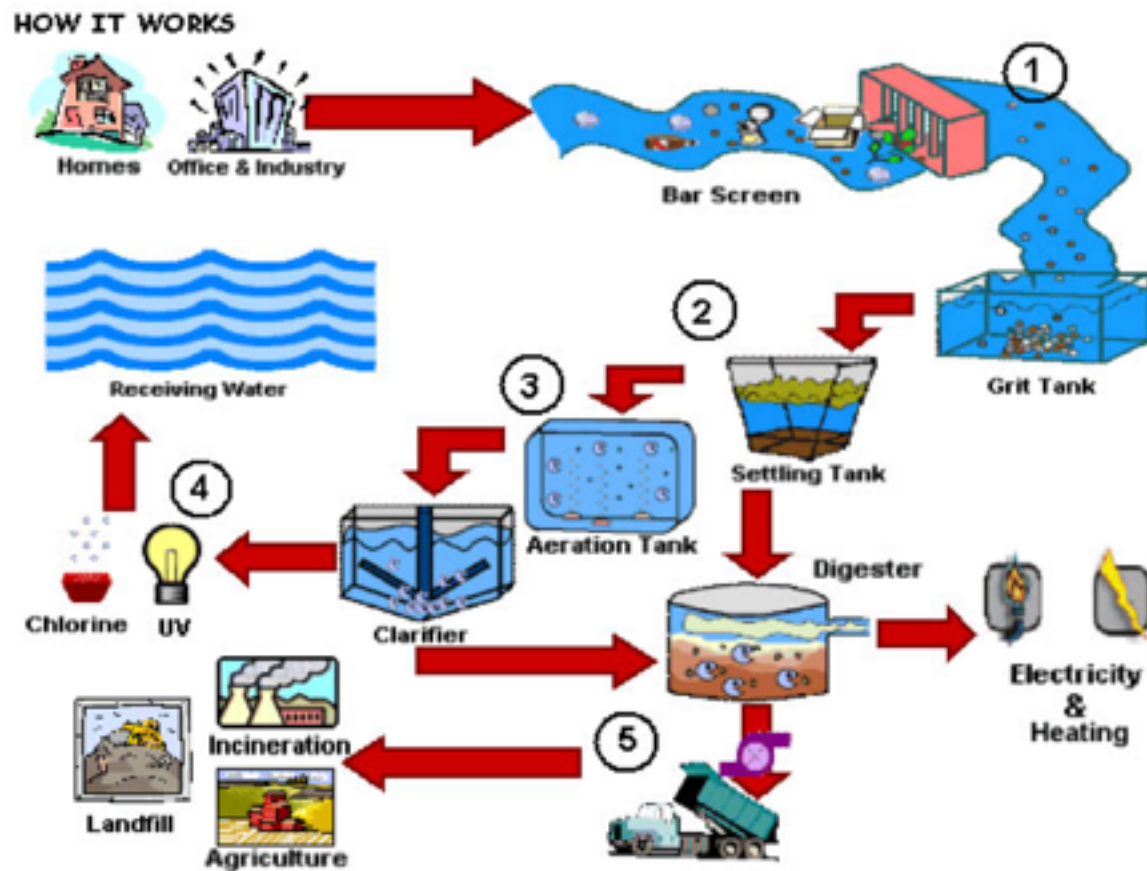
- Wastewater treatment plant operators may be injured by slips, trips and falls on wet floors;



Who is a wastewater treatment plant operator?

A skilled worker who is responsible for the day-to-day operation, maintenance, trouble-shooting and handling of special problems of municipal, industrial, and other wastewater treatment plants. What

### Gallery 1.1 Wastewater treatment plant



*working procedure of waste water treatment plant*

what is dangerous about this job?

- By falls into treatment ponds, pits, clarifiers or vats and by splashes of hazardous liquids;

- They may suffer cuts and pricks from sharp tools, contusions, etc. They are exposed to hazards related to work in confined spaces.

- Other common hazards include electric shock, explosions, entanglement in moving machinery, etc.

TYPES OF HAZARDS

ACCIDENT HAZARDS

PHYSICAL HAZARDS

CHEMICAL HAZARDS

BIOLOGICAL HAZARDS

ERGONOMIC, PSYCHOLOGICAL AND

ORGANIZATIONAL FACTORS

TYPES OF HAZARDS - ACCIDENTAL

- SLIPS AND FALLS
- FALLS INTO THE UNITS OF OPERATION
- CONFINED SPACES EXPOSURE – SUFFOCATION, POISONING
- BURNS BY STEAM, HOT VAPOURS
- ELECTRIC SHOCK
- CUTS AND PRICKS BY SHARP TOOLS AND EDGES
- INJURIES BY FLYING PARTICLES

- FIRE & EXPLOSIONS
- VIGOROUS CHEMICAL REACTIONS
- ACUTE POISONING
- ACUTE INTOXICATION BY ERRONEOUS DRINKING OF RAW WASTEWATER
- DAMAGE TO EYES
- CHEMICAL BURNS

**TYPES OF HAZARDS - CHEMICAL**

- CHRONIC POISONING BY INHALATION OR INGESTION OF A VARIETY OF CHEMICALS USED
- DERMATOSES CAUSED BY SKIN EXPOSURE TO WASTEWATERS, CLEANING AGENTS, ACIDS, ALKALIES ETC.,
- LATEX ALLERGY CAUSED BY THE USE OF LATEX GLOVES

**TYPES OF HAZARDS - BIOLOGICAL**

- INFECTIOUS DISEASES CAUSED BY BACTERIA, VIRUSES ETC.,
- CONTACT DISEASES DUE TO CONTACT WITH TOXINS
- DISEASES BY RODENTS, INSECTS

**TYPES OF HAZARDS - PHYSICAL**

- EXPOSURE TO EXCESSIVE NOISE LEVELS
- EXPOSURE TO UV RADIATION
- ADVERSE WEATHER CONDITIONS (HIGH TEMPERATURE, COLD, HEAT, SNOW FALL, HEAVY RAINS ETC.,)

**PREVENTIVE MEASURES**

- USE SAFETY SHOES / BOOTS WITH NON-SLIP SOLES
- WEAR ALWAYS PPE
- DO NOT MIX CHEMICALS WITHOUT SUPERVISION
- CHECK ELECTRICAL EQUIPMENT FREQUENTLY
- WEAR SAFETY GOGGLES
- WEAR RESPIRATOR / GAS MASK
- TAKE EXTREME CARE WHEN HANDLING CORROSIVE AGENTS AND CHEMICALS
- LEARN AND USE SAFE LIFTING AND MOVING TECHNIQUES
- DO NOT SMOKE, EAT OR DRINK
- USE NON-LATEX GLOVES
- ALL SHOULD UNDER GO PERIODICAL MEDICAL EXAMINATIONS
- Proper care and use of the equipment examination

## CONSTRUCTION MATERIALS INDUSTRY

### IMPACTS

- EXTREME NOISE, HEAT, DUST AND FUMES ARE FACTS OF CONSTRUCTION INDUSTRY
- EXCESSIVE HEAT CAUSES HEADACHE, CONFUSION AND EVEN COMA
- DUE TO HIGH NOISE LEVELS THEY CAN PERMANENTLY DAMAGE THE HEARING OF EXPOSED WORKERS
- OVER EXPOSURE TO DUST AND FUMES CAUSE DISABLING CHRONIC LUNG DAMAGE.

### Preventive measures

- Safety and equipment maintenance programs to be followed regularly.
- Good housekeeping should be strictly followed
- Employers must provide machinery guards
- Train workers and provide PPE
- SAFETY STANDARDS SHOULD BE STRICTLY FOLLOWED
- PREFER INDUCTION FURNACES
- STORE CHEMICALS AND OTHER MATERIALS IN SUCH A WAY THAT THEY SHOULD NOT SPILL OUT

- REDUCE POISONOUS GASES EMISSIONS BY USING NATURAL GAS AS A FUEL

### Interactive 1.1 safety wwtp

**HAZARDS & PREVENTIVE MEASURES  
IN WASTEWATER TREATMENT PLANTS**



**CHAITHRA B.R**  
**ASSISTANT PROFESSOR**  
**DEPT. OF CIVIL ENGG.,**  
**S J B COLLEGE OF**  
**ENGINEERING**  
**BENGALURU 560 060**

*safety considerations at wwtp*

### Gallery 1.2 safety considerations



*site safety*

## Review 1.1 safety rules

a safety sign which tells you that you must not do something is which color?

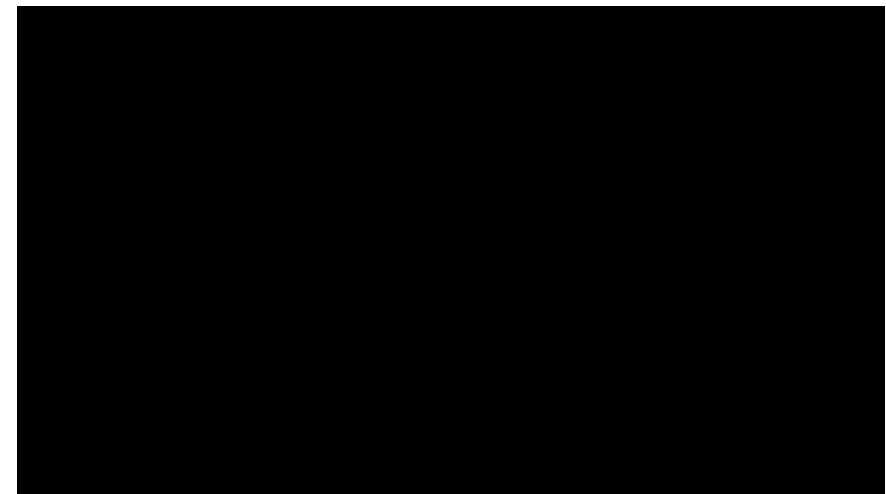
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- A.** red
- B.** yellow
- C.** blue
- D.** green

[Check Answer](#)



## Movie 1.1 workplace safety



# Safety engineering

safety engineering is an engineering discipline which assures that engineered systems provide acceptable levels of safety. It is strongly related to industrial engineering/systems engineering, and the subset system safety engineering. Safety engineering assures that a life-critical system behaves as needed, even when components fail.

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## Related Glossary Terms

Drag related terms here

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**Index**

Find Term



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## Related Glossary Terms

Drag related terms here

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**Index**

Find Term