Waste Water Treatment from Refinery & Petrochemical Units

2 days **TER-EN-P**

Overview

LEVEL

Skilled

PURPOSE

This course provides a deeper knowledge of waste water treatment processes.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

identify the impact of pollution on the environment,

adapt treatment operating parameters to the properties of incoming polluted water issued from refinery or petrochemical plant,

improve the operation and maintenance of equipment,

react effectively in adverse situations,

set a basis for regulation.

WAYS AND MEANS

Equipment demos (material, pictures and videos).

LEARNING ASSESSMENT

Quiz.

PREREQUISITES

Provide evidence of a professional experience of at least 3 months within waste water treatment unit.

Agenda

LOCAL & REGIONAL REGULATIONS — 0.25 d

Operating permit: structure, contents, key chapters, elaboration and updating process.
Waste water specifications. Penalties in case of violation (formal requirements, fines).

WASTE WATER CHARACTERISTICS — 0.5 d

Natural sources and components. Various uses of water in operating units. Effluent rejection points.
Nature of water pollutants (hydrocarbons, acidity, suspended matters, phenols, sulfides, mercaptans).
Analytical methods used in the laboratory and through on-line analyzers. BOD, COD, TOC.
Pollution mechanisms, impact on environment (insoluble, organic carbon, eutrophization, sludge).
Measurement of pollution: pollutant concentrations, quantities by unit of time. Typicals.

PHYSICO-CHEMICAL WATER TREATMENT PROCESSES — 0.5 d

Process water stripping: typical process scheme, optimum operating conditions.
Settling of insoluble hydrocarbons and sludge. Settling velocity. Settler design types and improvements.
Dissolved air floatation: equipment, flocculation additives, additive mix and operating parameter optimization.
Filtration: various equipment, sand, active carbon beds, other filtration media.

BIOLOGICAL TREATMENT OF WASTE WATER

0.5 d

Growth of bacteria colonies. Required feed and nutrients. Biofiltration of process water.
Biological treatment technology: bacteria filters, activated sludge basins. Operating conditions.

BIOLOGICAL SLUDGE TREATMENT

0.25 d

Sludge physio-chemical properties
Thickening methods: settling, press filtration, flocculation-floatation, centrifugation.
Analytical test methods: dry matter, heat value, volatile fractions, heavy metals.
Treatment processes: digester, wet oxidation, thermal hydrolysis, incineration, smell control.