E&I Technology for Oil & Gas Facilities

5 days **E&I-EN-P**

Overview

LEVEL

Knowledge

PURPOSE

Provides the basic knowledge for electrical & instrumentation equipment used in the Oil & Gas industry.

LEARNING OBJECTIVES

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

identify electrical and instrumentation equipment used in Oil & Gas,

acquire the technological knowledge necessary to understand the control and safety schemes.

WAYS AND MEANS

Demonstration (illustration) of process control on dynamic simulator (IndissPlus de CORYS).

LEARNING ASSESSMENT

Quiz.

PREREQUISITES

Provide evidence of a professional experience of at least 1 month, related to the concerned field.

Agenda

ELECTRICAL & ELECTROTECHNIC BASICS — 1.5 d

Generalities: origin of electricity, electrical energy production, alternate and direct currents, the electrical circuits. Standards, symbols, different types of electrical drawings.
Electrical generation: alternator, coupling of sources and throughput on structured networks.
Equipment monitoring and maintenance.
Electrical networks: constitution of an HV and LV network, architectures and equipment. Constituents: HV & LV boards and cabinets. Transformers. Breakers, control elements and isolation. UPS and batteries. Protections.
Asynchronous motors: constitution and operation of three-phases AC electric motors. Electric motor-related equipment.
Electrical risks: hazards in the electrical installations. Effects and consequences of the electrical risks. Protection against the electrical risks.
Hazardous areas classification: current standards (API RP 500, European ATEX standards) and applications on Oil & Gas facilities. Protection and identification of the material set in hazardous area.

FIELD INSTRUMENTATION — 2 d

Control loop: function and symbolization.
Field instrumentation: main technologies for measuring pressure, temperature, level, flow.
Automatic valves: technologies of control valves and on-off valves. Role of accessories: limit switches, solenoid valves, positioners…

CONTROL SCHEMES — 1 d

Single loop: structure and representation.
Control schemes: single loop, cascade, split-range. Case of overrides.
PID controller: control diagrams. Function, operation, direction of action and operating modes.
Automatism: distributed control systems. Operation of a controller, operator interface, network architecture.

SAFETY INSTRUMENTED SYSTEMS (SIS) **0.5 d**

Identification of Safety Instrumented Systems.
Fire and gas sensors: main technologies and applications.
Different safety systems and architecture.