Fundamentals of Engineering Activities

5 days **PENG/FENGGB**

Overview

LEVEL

Knowledge

PURPOSE

This course provides an overview of the engineering studies of Oil & Gas projects, from conceptual phase to end of detailed studies.

LEARNING OBJECTIVES

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

coordinate all engineering activities, deliverables, work sequence and interfaces,

evaluate the main risks: schedule, vendors, interfaces, quality and how to mitigate them,

control engineering execution: critical issues and controls/KPI to put in place,

apply best practices, including management of changes, progress control, interfaces, etc.

WAYS AND MEANS

Half of the training is devoted to hands-on exercises on engineering discipline and management tasks.

LEARNING ASSESSMENT

Quiz at the end of the module.

PREREQUISITES

No prerequisites for this course.

Agenda

FROM PRE-PROJECT STUDIES TO ENGINEERING — 0.75 d

Context of a field development project.
Preliminary, conceptual and pre-project studies.
Basic engineering and Front-End Engineering Design (FEED).
Detailed engineering.
Greenfield vs. brownfield projects.
Discipline overview.

CONTRACTUAL SCHEMES — 0.25 d

Scope of works of the engineering activities.
Statement of requirements and basis of design.
Roles of contractors and subcontractors.
Supervision role by company team.
Organization requirements for each party involved.

PROCESS DESIGN — 0.5 d

Specifications for crude oil and natural gas and necessary treatments.
Equipment standards, basis of design, equipment list and sizing.

Flare, power supply, control and safety loops.
Process simulations.
Oil & Gas process diagrams: block flow, process flow, piping and instrumentation.

STRUCTURE & MECHANICAL

1 d

Pipe racks, loads and pipe supports.
Equipment design.
Static and rotating equipment.
Types of pumps.

SAFETY IN DESIGN

0.5 d

HAZID, HAZAN and HAZOP.
Plant layout, escape routes and fire zones.

SITE PREPARATION & CIVIL WORKS

0.5 d

Concrete slabs and foundations.
Vendor drawings.

MATERIALS & CORROSION

0.5 d

Material classes and selection, corrosion control.
Cathodic protection system design.
Painting insulation specifications.
Piping material, classes, installation and stress analysis.

ELECTRICITY & INSTRUMENTATION

0.5 d

Single-line diagrams.
Database management.

AREAS OF CONCERN DURING ENGINEERING EXECUTION

0.5 d

Typical critical path of an Oil & Gas project.
Internal constraints of the engineering schedule: interfaces between disciplines, vendor input.
Coordination between engineering, procurement and construction activities.
Interface management, change management.
Actual progress control and reporting.
Standardization procedures.