Leaders Development Institute

Certified Courses

Offshore Engineering

INTRODUCTION

- The Oil and Gas industry have offshore design engineering and construction projects as well as maintenance services which are technically and commercially challenging therefore good knowledge and competency of the project team members throughout the different phases of works are keys to the successful execution of these projects. This training seminar aims to provide the participants with comprehensive foundation knowledge of Offshore Engineering.
- This Offshore Engineering training seminar starts with an introduction of Field Development Planning (FDP) and Project Management, followed by design engineering, procurement, substructures and topsides fabrication, load-out and sea transportation, offshore installation, hook-up, commissioning, and start-up. An overview of the major and support marine vessels, cranes and pipe-laying equipment will also be described. This training seminar places particular emphasis on the principles and steps of the works, using engineering calculations, flowcharts and diagrams to enhance the learning experience of the participants. Relevant international and typical client engineering standards will be referred to. Rules of thumb, engineering formulas, flowcharts and diagrams will be used to illustrate the principles and steps required for each part of the work. Real-life project examples as well as video clips will be used to demonstrate these offshore engineering activities and to aid the familiarisation and learning of the participants.
- With a good foundation knowledge of offshore engineering, it is hoped that the participants will be better prepared to function in the design engineering, fabrication and construction department, offshore installation, hook-up, commissioning and start-up of offshore projects. Such roles include field and discipline engineers, project engineer, cost estimating engineers, fabrication contract admin executives, CSR, construction supervisors and engineers, or fabrication engineer. This Offshore Engineering training seminar will also be useful for university lecturers who wish to supplement their teaching materials and theoretical knowledge with real-life domain or practical knowledge of offshore engineering competencies and skills in pursuit of their CPD certification with Institution of Engineers at their respective countries.

This training seminar will feature:

- Overview of field development planning (FDP) and project management
- Design engineering process, deliverables and flowchart
- Fabrication techniques such as cutting and welding, blasting and painting
- Erection and assembly techniques, including cranes and lifting techniques
- Load-out techniques, preparations and ballasting
- Sea-fastening engineering and implementation
- Major and support marine vessels, major installation equipment
- Structure and topsides installation techniques
- Pipelaying and riser installation activities
- Subsea installation and diving support activities
- Hook-up workpack process and execution
- Mobilisation of marine vessels, construction crew, marine crew and construction equipment
- Hook-up activities for each engineering discipline
- Commissioning activities, start-up and handover to client

OBJECTIVES

By the end of this training seminar, participants will be able to:

- Understand what entails in Field Development Planning (FDP) and project management
- Understand the complexities of Offshore Engineering activities
- Appreciate the complete metamorphosis of Offshore Engineering –from the Design phase till the Commissioning and Start-up phase
- Understand Fabrication, Erection, Loadout and sea-fastening implementation at Fabrication yards
- Understand the selection of the major support marine vessels and major installation equipment for offshore installation works
- Fully understand the structure and topsides installation techniques
- Understand what is involved in Pipelaying and riser installation works & Subsea installation and diving support activities
- Fully understand what are involved in mobilisation of marine vessels, construction crew, marine crew and construction equipment
- Understand the scope of work for hook-up and commissioning activities

TRAINING METHODOLOGY

- This Offshore Engineering training course will be conducted in a classroom. Examples and video clips of past offshore fabrication and load-out activities, as well as offshore installation activities will be used to aid the learning and understanding of the subject matters. Participants will also take part in group classroom exercises to reinforce their learning experience. Each participant will receive a set of training course materials. There will also be pre-seminar as well as post-seminar assessment tests.

WHO SHOULD ATTEND?

This training seminar is suitable to a wide range of professionals but will greatly benefit:

- Field Engineers, CSRs, Construction Supervisors, Project Engineers
- Operations Engineers
- Workpack Engineers
- Structural Engineers
- Metocean Engineers
- Pipeline Discipline Engineers
- Subsea Equipment Engineers
- Various Discipline Engineers (structural, piping, equipment, electrical, instrumentation)
- Maintenance Engineers
- Contract Admin, Buyers and Procurement Executives
- Cost Estimating, Project Control and Planning Engineers
- Diving and Diving Support Personnel
- Managers and Executives who are new to Offshore engineering projects
- Other Engineers and Technicians who need to update their current Oil and Gas industry experience and wanting to move to Offshore Field development Projects
- University Engineering Lecturers who wish to be CPD-certified by Institution of Engineers (IEM) at their respective countries

Course Outline

Field Development (FDP), Project Management and Design Engineering

- Pre-course Assessment Test
- Course Learning Objectives vs. Course Participants' Expectations
- Overview of Field Development Planning (FDP)
- Project Management Team (PMT), Roles and Responsibilities
- Contracting, Subcontracting and Procurement Activities
- Design Engineering Process, Deliverables and Flowchart
- Health, Safety, Environment and Security Requirements, including training requirements and qualifications of personnel
- Emergency Response Procedure (ERP)
- QAQC Requirements, Documentation and Drawings Controls

Fabrication and Onshore Construction

- Fabrication Yard Layout, Load-out Methods, Workshops and Major Equipment Types, Foundation Preparation and Preliminary Works
- Planning and Schedule, Fabrication Cost-Time-Resource (CTR) Estimating
- Fabrication, Erection and Assembly of Major Structures, Substructures: Topsides and Living Quarters
- Pipeline Procurement, Concrete Coatings, Pipeline Load-out and Transportation

- Welding and Welder Qualifications
- Blasting and Painting Activities: Testing and Inspection Requirements
- Typical Manpower and Fabrication Equipment Planning and Management
- Skid and Packaged Equipment Procurement, Factory Acceptance Testing (FAT), Delivery, Storage and Preservation and Installation
- Weight Control and Weighing of Structures in Fabrication
- Yard Pre-commissioning Activities
- Jacket Commissioning, Trial Fitting and Ship Loose Items Management
- Pile and Conductors Make-up and Fabrication, Transportation Arrangement Consideration and Load-out
- Load-out Planning, Engineering for Substructures and Topside; and Load-out Execution, Ballasting Techniques and Calculation
- Insurances, Commercial and Warranty Surveys

Offshore Facilities, Pipelaying and Subsea Installation I

- Offshore Transportation and Installation Phases, including Planning and Scheduling
- Major and Support Marine Vessels, Major Equipment Types
- Offshore Installation Considerations, Engineering and Calculations
- Weight Control and Onshore Weighing Reports of Structures
- Transportation Analysis and Sea-fastening
- Launching, Lifting and Installation of Substructures
- Upending of Substructures
- On-bottom Stability, Pile and Conductor Make-up, Piling and Grouting of Substructures
- Lifting Analysis of Topsides and Modular Topsides Construction
- Float Over of Integrated Topside Deck
- Geotechnical and Geomatics Surveys
- Anchor-pattern Preparation and Approval

Offshore Facilities, Pipelaying and Subsea Installation II

- Vessels Availability, Contracting and Procurement Activities and Considerations
- Cost-Time-Resource (CTR) estimating for Transportation and Installation
- IPOP and Pre-execution Reviews
- Mobilisation Preparations
- Insurances, Commercial and Warranty Surveys
- Metocean Activities and Installation Window Considerations
- Substructures Installation - launching, lifting, self installation & novel methods
- Topsides Installation - modular lifts, float-over and novel methods
- SIMOPS Considerations for Offshore Installations
- Pipeline and Riser Installation
- Reel Pipelines and Umbilicals Laying
- Subsea Equipment Installation and Diving Support Activities
- Insurances, Commercial and Warranty Surveys

Hook-up Construction and Commissioning (HuCC)

- HuCC Project Planning and Scheduling, Monitoring and Reporting
- Workpack Process and Execution
- Procurement - cost-plus and overheads
- Construction and Marine Crew Manpower Recruitment and Mobilisation
- Onshore Minor Fabrication
- Mobilisation of Major and Support Marine Vessels
- Overview of Marine Operations
- Onshore Supply Base and Load-out Activities
- Logistics Support Activities
- Hook-up Activities, namely blasting and painting, cutting, fitting and welding, piping and piping supports, platform appurtenances, electrical and instrumentation works
- Pre-commissioning Activities, Hydrotesting, NDT and Inspection
- Commissioning Activities and Dossiers
- Start-up (first oil, first gas), Hand-over and Punch-list Items
- Post-project Activities, Final Documentation, Change-order and Variation Orders, Lesson Learnt Database and Dissemination
- Course Summary
- Post-course Assessment Test

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