



Arabian Institute For Training

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# Fundamentals of Deepwater Riser Engineering

## INTRODUCTION

- This training course on Fundamentals of Deep Water Riser Engineering is an introduction to the world of deepwater subsea products, there are many components in the field architecture of offshore and subsea projects, varying from Xmas Trees, manifolds, controls systems and risers with their variety from drilling to completion to production and injection risers.
- This 5-day Fundamentals of Deepwater Riser Engineering training course will provide the basics of riser engineering by identifying the various riser types, their main components, the fundamental design methodologies used to identify the appropriate design for each project as well as running through the product life cycle and detailing the testing requirements for risers and their components and moving on to the main installation techniques and finally addressing the integrity management and life of field operation of deep water risers.

### This training course will highlight:

- Overview of offshore and subsea projects
  - Fundamentals of offshore and subsea intervention
  - Introduction to riser types
  - Design requirements and selection of risers
  - Drilling and completion risers
  - Rigid risers (top tension risers, steel catenary risers)
  - Hybrid flexible risers
  - Risers integrity management
  - Risers IRM (Inspection, Repair and Maintenance) requirements
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## OBJECTIVES

By the end of this training course on Fundamentals of Deep Water Riser Engineering, participants will learn to:

- Develop a global understanding for offshore and subsea architecture considerations
- Understand the environmental parameters affecting the design of deepwater risers
- Determine the different types of risers and their equivalent applications from drilling, completion and production / injection
- Learn about the installation process for the various types of deepwater risers
- Determine the integrity requirements for deepwater riser systems as well as understand the aspects covered in inspection and maintenance programs offshore
- Address the technical aspects of deepwater risers on a day to day basis and apply the learning from the course in a real life setup

## TRAINING METHODOLOGY

- The participants on this training course will receive a well-structured suite of seminars presented in a logical sequence to build their working knowledge in the area of deepwater riser engineering. There will be a mix of presentations and exercises to help consolidate the learned material as well as demonstration videos and 3D animation in order to help the participants visualize the content. At the end of every day there will be Q&A sessions to help combine the learning presented through the day into a bigger picture for the topic as a whole.

## ORGANISATIONAL IMPACT

- This training course on Fundamentals of Deep Water Riser Engineering is tailored to mimic the day to day application of the topic in the work setup. The sequence of the training sessions leads the participant to build their knowledge from a broad view of the offshore / subsea field, closing in onto the specifics of deepwater riser engineering, installation, commissioning and life of field operations. The use of such knowledge provides a sound foundation for personnel intending to work on offshore/subsea projects where risers comprise an important aspect of the project delivery and will allow them to execute their projects more efficiently.

## PERSONAL IMPACT

- As the search for Oil and Gas resources continues to develop further, more and more reservoirs are being explored in the deeper sectors of the oceans and seas all around the globe. Offshore subsea deepwater operations have become a fundamental aspect of the industry. This Fundamentals of Deepwater Riser Engineering training course covers one of the most important aspects of hydrocarbon delivery systems from the offshore / subsea fields to the fixed or floating production systems.
  - The knowledge gained will help the participant in the development of their technical and engineering management expertise and will place them in a favorable position to take on leading roles in deepwater projects.
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## WHO SHOULD ATTEND?

- This Fundamentals of Deepwater Riser Engineering training course is useful for technical and non-technical professionals in the offshore oil and gas industry or those working onshore and keen on developing their offshore engineering capabilities.

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

- Project Engineers
- Subsea Engineers
- Operation Engineers
- Field Development Engineers
- Project Delivery Engineers
- Offshore Installation Engineers
- Offshore Project Managers
- Non-technical Junior and Senior-level Personnel

## Course Outline

### Introduction to Offshore systems and the environment

- Offshore Systems Overview - Field Development Concepts
- Construction Vessel Types
- Basics of Metocean Conditions (wind, wave, current) and Its Effect on Offshore and Subsea Structures
- Subsea Intervention Operations from Construction Vessels
- Remotely Operated Vehicles Types and their Uses in Offshore Operations
- Remotely Operated Vehicles Tooling

### Overview of Risers and Riser Design Considerations

- Introduction to Different Types of Risers Used in Deepwater Applications
- Overview of Loads Impacting on Risers and How Data is Used in the Design Process
- Riser Design Methodologies
- Rigid Risers: Low Pressure and High Pressure Drilling Risers
- Rigid Risers: Completion Risers

### Overview of Risers (continued)

- Description of the Functional Requirements and Components of the Different Types of Deepwater Risers Systems whether they are Rigid or Flexible Systems
  - Rigid Risers: Top Tensioned Risers
  - Rigid Risers: Steel Catenary Risers
  - Flexible Risers: Hybrid Systems
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## Deepwater Risers PLC and Installation

- Overview of the Deepwater Riser Systems Product Life Cycle (PLC)
- Conceptual Design Phase Considerations
- Fabrication
- Component and System Testing
- Drilling Riser Installation
- Completion Riser Installation
- Production Riser Installation

## Risers Integrity Management and IRM

- Offshore and Subsea Integrity Management Basics
- Integrity Management Programs for Deepwater Risers
- Development of an IRM (Inspection, Repair and Maintenance) Strategy for the Life of Field
- Implementation of the IRM Program using Subsea Intervention Techniques



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