

# Subsea Structures and Installations



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**(A Maritime Company for Courses, Conferences and  
Research)**

**Glasgow, UK**

### About the Course

The course focuses on subsea systems from design and installation through to operation. This course explains how the whole system works in conjunction.

The course gives detailed idea about design, analysis, construction and installation aspects of subsea manifolds, SSIV structures, wellhead protection structures, integrated drilling/manifold templates, riser bases and flexible riser system ancillary equipment. The design part also includes the strength evaluation of suction piles which supports the subsea structures.

The course gives in-depth, technical aspects detailing the engineering behind Flow line installations, Riser, umbilical and its substructures spool installations.

The course content gives a brief description about the subsea installation process, different methods of installation, and the different types of subsea installation vessels.

### Who Should Attend

Engineers and researchers involved in the design of subsea structures and subsea systems, Contracts engineers, Flowline engineers, Team leaders, Conversion Engineers, Pipeline engineers, Project engineers and managers, Subsea and offshore controls engineers, Safety inspectors will benefit from attending this course. The course is innovative in both content & structure with a careful balance of theory & practice.

### PROGRAMME

#### Day 1

09.00 - 10.30 Lecture 1: Subsea Structure: General Overview

10.30 - 11.00 *Break*

11.00 - 12.30 Lecture 2: Subsea Structures Design

12.30 -13.30 *Lunch*

13.30 – 15.00 Lecture 3: Subsea Structures: Design Examples

15.00 - 15.30 *Break*

15.30 - 17.00 Lecture 4: Subsea Separation and Production

#### Day 2

09.00 - 10.30 Lecture 5: Installation of Rigid Flowlines

10.30 - 11.00 *Break*

11.00 - 12.30 Lecture 6: Installation of Flexible, Risers & Umbilicals

12.30 - 13.30 *Lunch*

13.30 - 15.00 Lecture 7: Installation Subsea Structures & Spools

15.00 - 15.30 *Break*

15.30 - 17.00 Lecture 8: Subsea Installation Vessels

### ***Lecture 1: Subsea Structures - General***

Subsea Structures Within Subsea Development Concepts  
Categories & Functional Roles of Subsea Structures  
General arrangements & key components of subsea structures  
Regional Characteristics

### ***Lecture 2: Subsea structure-Design***

Functional Requirements  
Regulatory and Design Code Framework  
Key design drivers  
Design methods and analysis tools/techniques

### ***Lecture 3: Subsea structure- Design Example***

Multi Slot Manifold  
Fishing Protection Structure  
Manifold Template  
In-Line Structures

### ***Lecture 4: Subsea Separation and Production***

- Separation and pressure-boosting operations that are performed subsea, whether downhole or on the seabed
- two-phase and three-phase separation
- Pressure-boosting
  - using multiphase pumps and wet gas compressors
- Water disposal
- Reinjection

### ***Lecture 5: Installation of Rigid Flow lines***

Rigid pipeline installation methods, S Lay, J Lay, Reel Lay, Advantages and disadvantages of various lay methods, practical examples, catenary equations, Tow & Pull methods, Shore Pull, Tie-in, Difference between shallow and deep water pipe-lay  
Lay Analysis, Stages of Analysis, Operability Rosettes, Initiation, Normal lay, Abandonment & Recovery analysis, Installation fatigue analysis, Critical parameters during lay, Lay in curve, Installation of pipeline end structures and In line Tees.  
Trenching & Back filling, Trenching Analysis, Marine Warranty during pipe-lay.

### ***Lecture 6: Installation of flexible risers & Umbilical***

Introduction to flexible and umbilical, Difference between rigid pipe and flexible pipeline installation, Flexible and umbilical lay methods, Flexible and umbilical spooling, Installation of flexible and umbilical end structures, Various types of flexible risers, Flexible riser installation. Practical Example.

### ***Lecture 7: Installation of subsea structures & spools***

Various types of subsea structures, spools, Different considerations during installation of subsea structures and spools, Structure and spool installation analysis, Stages of analysis, Critical parameters for analysis, Practical examples, Rigging design, Recovery considerations, Role of ROV during installation.

### ***Lecture 8: Subsea installation vessels***

Examples of different subsea construction and pipelay vessels, Requirements of a subsea construction vessel, DP-2, DP-3 vessels and their differences, RAOs of a vessel, Heave Compensated crane, Various types of ROV, ROV tooling requirements for subsea operations, Subsea Installation aids