# Subsea Structures and Installation Course

**21 — 22 March 2016**

**London, UK**

***This course meets the requirement for Continuing Professional Development (CPD) of the Royal Institution of Naval Architects (RINA)***

## 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.

## COST

Course fee will be ***£650+VAT*** which includes course notes and lunches. The fee doesn't include accommodation. You should make your own arrangements for accommodation.

## VENUE

**Croydon Park Hotel**
7 Altyre Road
Croydon,
Greater London,
CR9 5AA

(All delegates are entitled to a special rate of £3.00 per car for full days parking)

## COURSE OUTLINE

### Lecture 1: Subsea Structures - General Overview
*By Duncan Warwick*

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
*By Duncan Warwick*

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

### Lecture 3: Subsea structure- Design Example
*By Duncan Warwick*

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

### Lecture 4: Subsea Separation and Production
*By Elstine Padayattil*

- 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 and Reinjection

### *Lecture 5: Installation of Rigid Flow lines*
*By Tanmay Sarkar*

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 & Umbilicals*
*By Tanmay Sarkar*

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*
*By Tanmay Sarkar*

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*
*By Tanmay Sarkar*

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

## ABOUT THE LECTURERS

*Duncan Warwick*

Duncan Warwick gained a BSc in Naval Architecture & Ocean Engineering from the University of Glasgow in 1985. After a 5 year period of research and lecturing in Ship and Ocean Structures also at the University of Glasgow he has gained 23 years' experience in the field of offshore subsea structural engineering. His experience includes the 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. He also has experience in the design and installation of deepwater structures such as in-line PLETS and PLEMs and suction pile founded deepwater manifolds. This experience has been gained with turnkey subsea engineering contractors including McDermott's, Rockwater and Technip. From 1999 to 2006 he was Team Leader of the Subsea Structures and Equipment Engineering Team within Technips' Offshore Engineering Division which supported the Technip Group worldwide in the design and analysis of subsea structures and pipelay equipment engineering. Since 2006 he has been Team Leader of the Subsea Structures Design Team within Genesis where he has specialised in the design of subsea structures from concept through to detailed design.

*Elstine Padayattil*

Elstine Padayattil is presently working as a Naval Architect in ASRANet Ltd in Glasgow, UK. Elstine graduated in 2014 with an undergraduate degree in Naval Architecture and Marine Engineering from the University of Strathclyde, Glasgow. He did his MSc in Subsea Engineering. Elstine has experience in working with the production facility of Cochin Shipyard Limited, India (CSL). He assisted in conducting a routine review of the production methodologies. In addition, he aided the repair yard team in overseeing the retrofitting on variety of ships. Working with Harland and Wolff Heavy Industries Ltd, he helped a group of naval architects in a vessel coming for repair .

*Tanmay Sarkar*

Tanmay Sarkar is presently Team Leader of Marine Warranty group in London. He is a PhD from University of Strathclyde, Glasgow, a Chartered Engineer and member of Royal Institution of Naval Architects (RINA) and Indian Institute of naval Architect. He is also a member of Membership Committee of RINA. Dr Sarkar is also a Technical Authority within Noble Denton for Subsea Pipeline Installation and responsible for first ever publication of Guideline for Submarine Pipeline Installation of Noble Denton. He is currently Project Manager of marine warranty scope of several deep water subsea projects in Western Africa. Dr Sarkar has several years of experience in offshore installation in key roles and worked for major installation contractor's such as Saipem, Subsea7 and CTC Marine Projects. He also has more than twenty publications in leading journals and conferences. He is involved in teaching MSc students of Strathclyde University Pipeline Installation as a invited Lecturer. He project managed SURF part of the CLOV project marine warranty.

## REGISTRATION

☐ I wish to register for the course at a cost of ***£650 + VAT*** (UK only) including course material and workshop lunches.

***Payments can be made by cheque (made payable to ASRANet Ltd.), cash or bank transfer but no card payments. Please enquire for details.***

☐ Please invoice me at the below address

*Please do not make your travel arrangements until you receive an invoice from us*

NAME _____

ADDRESS _____

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EMAIL _____

TEL/MOB _____

### Disclaimer

All materials and information supplied during and associated with this course are intended purely for instructional purposes. Whilst every effort is taken to ensure that materials provided are accurate and suitable for training purposes, ASRANet Ltd accepts no responsibility for their accuracy or utility.

I accept the above

Signed _____

Date _____

The completed form should be sent to: **info@asranet.co.uk** OR to **ASRANet Ltd, 5 St Vincent Place, Glasgow, G1 2DH UK**