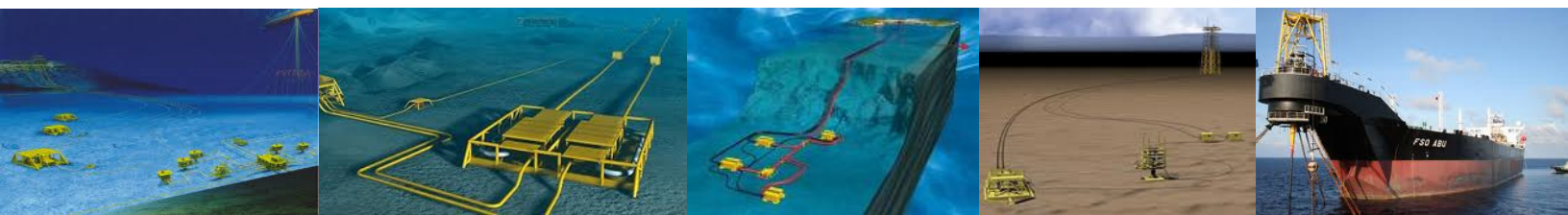


SUBSEA CONTROL SYSTEMS & UMBILICALS

27 – 29 September 2011, Kuala Lumpur, Malaysia



Expert Trainers:



Jonathan E. Williams, PhD

Chief Engineer – Azur Offshore Ltd
Member, Society for Underwater Technology SUT
Fellow, Institution of Mechanical Engineers
Fellow, Institute of Marine Engineering, Science & Technology
European Chartered Engineer (Eurlng)



Jean Luc Chasserot, TPA Professor

Technical Director – Azur Offshore Ltd

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About the Training Course

High system integrity combined with reliable control and accurate monitoring of subsea installations is essential to ensure the highest production availability, while providing a safe and environmentally friendly field operation.

As subsea production stretches the boundaries through long tiebacks, and high pressures, the demand on control systems becomes even higher. This training course will look into how subsea operators can better leverage on their systems to change their game for difficult fields. The course is designed to meet the harshest subsea challenges and to help engineers provide flexibility, expandability and upgradeability throughout the life of the field.

By attending this 3 day training course, you will be able to:

- ❖ Recognize the integrated nature of field architecture, system design and component selection
- ❖ Identify the appropriate application for subsea control systems, chemical injections and its mode of operation
- ❖ Examine the main subsea control system requirements, their functions, strengths, weaknesses and interfaces
- ❖ Learn subsea control modules, connections, interface with topside equipment and umbilicals
- ❖ Understand key design and installation issues through case studies
- ❖ Understand subsea control equipment procurement, maintenance, failures and safeguarding measures
- ❖ Explore new state of the art technologies for subsea production systems

Featured Case Study Discussions on:

Case study 1; Design Application exercise; Otter Field North Sea – Tie-back or FPSO- SPCS Functional Design

Based on a specific Field development requirement, the Participants will be guided to design a simple control system. This will cover the main considerations of control requirements, monitoring requirements, power and communication constraints. Duration - 2 hours.

Case Study 2: TOTAL Angola DALIA Field- The SPCS & Chemical Injections system

Topside equipment & FPSO ICSS interfaces. Umbilicals for Production control, water injection & Gas injection controls (total of 71 subsea wells). Subsea control modules, Multiphase meters & chemical injections. Intelligent well completions & control interfaces via the DTHXTree Tubing hanger. Underwater maintenance & repair. Duration – 2 hours

This training course is designed for

Engineers and technical professionals working in subsea projects who want a full understanding of the different types of control and umbilical systems applied, including:

- ❖ Subsea and flowline/pipeline engineers
- ❖ Riser and Umbilical engineers
- ❖ System Design engineers
- ❖ Process engineers
- ❖ Engineering team managers, leaders and supervisors
- ❖ Technical specialists and engineers from manufacturer and supplier companies

The training course has a limited attendance for up to 25 participants only. Sessions commence at 9am on all days, with short intervals at 10.30am and 3.30pm respectively. Lunch will be provided at 12:30pm for 1.5 hours. Sessions will end at 5pm on all days.

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Course Outline

Day One

Lecture L1; Reminder of Production Systems Building Blocks;

- Where they fit in the System Design and the Field Architecture
- Field configuration issues: number of wells, distance from Host, etc...
- Overview of topside and subsea controls equipment
- Water depth & riser/umbilical configurations
- XTree & manifold types

Lecture L2; Basic Control System Types;

- Control philosophy
- Direct hydraulic (historic context)
- Piloted and sequenced hydraulic
- Electro-hydraulic & multiplexed E-H
- Open vs closed hydraulic systems
- Advantages/disadvantages & selection
- Typical configurations & performance

Lecture L3; Functional Control System Requirements;

- Safety/shutdown
- Flow control
- Flow monitoring
- System condition monitoring
- Chemical injection
- Subsea process control
- Maintenance & repair

Lecture L4; Subsea Valves & Actuators;

- Gate valves
- Gate valve hydraulic actuators
- Choke valves
- Choke valve hydraulic actuators
- Valve position monitoring (switch & profiling)
- Down hole Safety valves (SSSV)
- Pilot valves
- Chemical injection valves
- Diver/ROV operated valves
- ROV over-ride

Lecture L5; Subsea Sensors & Instrumentation;

- Down hole sensors
- XT sensors
- Sand sensor
- Gas leakage sensor
- System integrity sensors
- Various meters for Gas, Water & Multiphase flows

Case study 1; Design Application exercise; Otter Field North Sea – Tie-back or FPSO- SPCS Functional Design; Based on a specific Field development requirement, the Participants will be guided to design a simple control system. This will cover the main considerations of control requirements, monitoring requirements, power and communication constraints. Duration - 2 hours.

End of Day One

Day Two

Lecture L6; Subsea Control Modules;

- SCM architecture
- Subsea Electronic Module (SEM)
- Hydraulic valve block
- Housing design
- Hydraulic accumulators & hydraulic fluids
- Typical SCM designs & SCM MB (mounting base)

Lecture L7; Subsea Connections & Communications;

- Electric & hydraulic flying leads
- Flying lead connectors
- Multi way stab connectors
- Inductive couplers

High-power electric connectors;

- Electric communication protocols (FSK, PSK)
- Signal on Power options
- Acoustic communication

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Lecture L8; Topside Equipment;

- Master Control Unit (MCU) requirements
- MCU components
- MCU design & engineering
- Hydraulic Power Unit (HPU requirements)
- HPU components
- HPU design & engineering
- Electrical Power Unit (EPU) requirements
- EPU components
- EPU design & engineering

Lecture L9; Subsystem Interfaces & Umbilicals;

- Umbilical optimization & design calculations
- Typical umbilical constructions
- Umbilical configurations
- Topside communications interface & umbilical termination (TUTU)
- Subsea umbilical termination assembly (UTA & SDU)

Lecture L10; System Reliability & Availability;

- Failure, repair and availability optimization
- Component failure-rate modeling
- Failure mode analysis
- Redundancy & common-mode failures
- Typical redundancy options

Case Study 2; TOTAL Angola DALIA Field- The SPCS & Chemical Injections system.

Topside equipment & FPSO ICSS interfaces. Umbilicals for Production control, water injection & Gas injection controls (total of 71 subsea wells). Subsea control modules, Multiphase meters & chemical injections. Intelligent well completions & control interfaces via the DTHXTree Tubing hanger. Underwater maintenance & repair.

End of day TWO

Day Three

Lecture L11; Subsea Safeguarding;

- Alarm and shutdown philosophy
- Fail-safe approaches
- Implementation of IEC61508 on subsea production control systems
- Integrated Control & Safety Systems

Lecture L12; Control System Design Procedure and Procurement;

- Requirements driven by FEED
- Design Code API RP 17 F / ISO 13628-6 (2nd Edition Dec 06)
- Typical FUNCTIONAL SPECIFICATION, a detailed review
- Control system configuration
- Iteration with field development configuration & reservoir engineering
- Bid documents & ITT
- Bid evaluation

Lecture L13; Subsea Production Control System, Equipment Testing & reported failures;

- Outline testing procedure and planning
- From FAT to SIT
- Outline sequence of operations and planning
- Reporting requirements & documentation
- Common failures & Industry reporting system
- Maintenance, storage & sparring of subsea control equipment

Lecture L 14; New Technologies for Subsea Production Systems;

- All Electric actuators & XTrees – Total K5F system performance to date
- Wireless communication
- Optical fibers communication
- Open system architecture
- High power systems for seabed pumping, processing & wet gas compression

End of Day Three & End of Course



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Your Expert Trainers:



Dr Jonathan E. Williams

Qualified from Cambridge, Imperial College and Cranfield. Jonathan has been involved in a variety of field development and joint industry R&D projects with major oil & gas companies including: riser system design on Draugen FPV for Aker, performance simulation and system design for GASP Subsea Separator (R&D JIP), NE Frigg for ELF Norge, control system specification and outline design on Toni for AGIP, configuration optimisation and outline design of control and chemical injection system on Otter field for Fina, followed by specification and ITT document preparation. He was also in technical assistance to other Azur Subsea Project

Engineers involved with Elf Girassol, Shell Malampaya, BP Greater Plutonio and Total Dalia. He has recently extended his experience into new technology development for offshore oil & gas operations, including: modelling of environmental impacts from drilling and production and decision-support; collaborative R&D projects on sensor and monitoring system technologies; open systems architectures for marine & offshore decision support systems; metocean forecasting systems for offshore intervention planning. He has worked for subsea equipment manufacturers and operator Oceonics plc, on development of wellhead control systems.



TPA Professor Jean-Luc CHASSEROT BSc . MSc

Started to work for the Energy Industry in 1972, after qualifying in Mechanical Engineering (BSc) & Industrial Engineering (BSc) in France. Worked on design & construction of several LNG carriers in French & US Shipyards Returned to France in 78 to join Comex Seal/Ind to move to Aberdeen.

Joined A.O.L. in Jan 83 to work in London on new field development Projects. Seconded to various Operators for:

- ❖ 83/ 85 BALMORAL Field for Sun Oil UK-New Semi FPV & large SPS/Pipeline system. Involved from system design up to offshore HUC.
- ❖ 86 / 88 Various short involvements on Glamis, Draugen FPV for Aker/Shell, GASP R&D subsea separation, Emerald, FROY for Elf Norge, Shell Brent ESDVs, TONI SPS for Agip UK and LYELL SPS / Intra field Flowlines & Umbilicals for tie-back to Ninian Host platform for Conoco.
- ❖ 89 / 94 ALBA Field for CHEVRON UK– Pipeline / Subsea supervisor – Northern Platform and New Floating Storage. Involved from conceptual design up to first oil start-up and trouble shooting offshore. AN Platform to FSU internal turret, pipeline bundle and provision for South subsea development.
- ❖ 95/ 96 SCOTT / TELFORD Subsea tie-back for Hamerada Hess / Laing Oil & Gas. Special retrofit multi riser system, including offshore work.
- ❖ Mid 96 /Mar 98 OTTER Field FINA UK – Subsea engineering manager responsible for FEED, detail design & bids. Simple SPS to FPSO or Tie-back.
- ❖ 98 / 00 Cameron France SA for ELF Angola, GIRASSOL Field, Senior Project Engineer based in Pau & Beziers looking after Hybrid riser, SPS, etc..
- ❖ DALIA FEED + prequalification and evaluation of novel Drill Through Horizontal XTrees. Drilling cost savings.
- ❖ Also worked in Houston & Singapore on the Shell Philippines MALAMPAYA Field to sort out the Field Architecture, System Design, the F.A. issues, the FEED and started Detail Design. Later on, monitored the SIT in Singapore.
- ❖ Mid 00 / 04 Various missions for A.O.L. in Australia / Singapore / Paris / Malaysia / Sarawak assisting clients in field development studies & training.
- ❖ Mid 04 / Feb 05 Senior Project Engineer / Auditor on TIOF Field studies for WOODSIDE Mauritania. in Perth & Nouak up to contract award.
- ❖ 05/06 Assisted BP Operations on GREATER PLUTONIO Field to develop the Operation Manual (on CD) level one, for large SPS/Lines & FPSO.
- ❖ 06/ Feb 07-2nd mission in Pau, to assist Total Angola on DALIA field development, deep water, world largest SPS / FPSO with 71 Subsea Wells for Production, Water Injection & Gas disposal. Also worked with all Package Managers to Prepare 7 Papers for OTC Conference - May 07.
- ❖ Apr 07 to Sep 09; assisted Petronas Carigali on 1st subsea gas tie-back K5 pilot project to wellhead platform and trained new group of Subsea / Offshore Engineers. Assisted Petronas Mauritania on Chinguetti FPSO replacement evaluation and engineering of W.O. operations.
- ❖ From Jul 09, developed Malaysia operations with JV Partner, SLT International in Kuala Lumpur (FLNG bid INPEX)
- ❖ March 10 / May 11 Organised & delivered Six SUT Africa Branch 5 days Subsea Engineering Courses in Nigeria, Angola & Ghana.
- ❖ For the past 22 years, regular lecturer in Offshore and Subsea Engineering at various engineering Schools / Universities in UK and France.
- ❖ OTHER QUALIFICATIONS; UK S.U.T. Certified / Registered Subsea Engineer in 88 and Fellowship awarded in 92. Cranfield Institute modular MSc in 88. Fellowship awarded in 96. Made TPA "Total Professeurs Associés" in Oct 2006 to present Lectures in Subsea / FPSO DeepW Field Developments.

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REGISTRATION FORM

Kuala Lumpur, Malaysia	Early Bird Price	✓	Normal Price	✓	TEAM DISCOUNTS
Subsea Control System & Umbilicals	S\$ 3499		S\$ 3699		PetroEdge recognises the value of leaning in teams. Group bookings at the same time from the same company receive the following:
PetroEdge In-house Training { } Yes, I would like to organise this training on-site and save over 25% of total course fees! For further information about On-site Training Solutions, please call +65 67419927 or email info@asiaedge.net					3 or more at 5% off 5 or more at 7% off 8 or more at 10% Team discounts are based on Normal Price only and are not applicable for other promotions.

DELEGATE DETAILS

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· Ms · Dr · Other ·

Telephone: _____ Email: _____

Job Title: _____

Department: _____

Delegate 2: _____ Mr
· Mrs · Ms · Dr · Other ·

Telephone: _____ Email: _____

Job Title: _____

Department: _____

Head of Department: _____

Company: _____

Address: _____

Country: _____

Postcode: _____

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Telephone: _____

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4 Easy Ways to Register

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Email: info@asiaedge.net

Phone: (65) 6741 9927

Fax: (65) 67478737

Please note:

- indicate if you have already registered by Phone · Fax · Email · Web ·
- if you have not received an acknowledgement before the training course, please call us to confirm your booking.
- photocopy this form to register multiple delegates.

Payment Methods

By Cheque/ Bank Draft: Make Payable to Asia Edge Pte. Ltd.

By Direct Transfer: Please quote AE1 with the remittance advise

Account Name: Asia Edge Pte. Ltd.

Bank Number: 508 Account Number: 762903-001Swift Code: OCBCSGSG

All bank charges to be borne by payer. Please ensure that Asia Edge Pte Ltd receive the full invoiced amount.

PAYMENT POLICY: Payment is due in full at the time of registration. Full payment is mandatory for event attendance. I agree to Asia Edge Pte Ltd. payment terms

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available for up to one year from the date of issuance. No refunds will be available for cancellations or postponements.

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