JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Subsea Control Module and Umbilical Design Training Course

1 – 5 November 2027
Rome

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Subsea Control Module and Umbilical Design Training Course

Ref: 2935_111516 **Date:** 1 – 5 November 2027 **Location:** Rome **Fees:** 7200 GBP

Subsea Control Module and Umbilical Design is a 1-week training course for subsea controls and umbilical engineers, who assemble a subsea control and umbilical design summary during the course. Longer tie-back distances, more wells per host and growing demand for electrical and fibre-optic signalling are pushing control architectures and umbilical cross-sections to their limits. Jupiter Prime Training presents this course on subsea control module and umbilical design.

Why Subsea Control Module and Umbilical Design Matters Now

Two forces shape the subject today. Operators want tie-backs that reach further from existing hosts, which stretches hydraulic response times and electrical power delivery along the umbilical. At the same time, integrity and operations teams expect richer condition monitoring from each well, so more communication capacity must fit inside the same cross-section. A control system sized too tightly leaves no spare functions for later wells, while an oversized umbilical adds cost, weight and installation risk. The course follows recognised international practice for subsea production control and umbilicals, described in general terms.

Who Gains Most from Subsea Control Module and Umbilical Design

- Engineers who define control system architecture for new subsea developments
- Engineers who specify umbilical cross-sections, tubes and electrical cores
- Engineers who interface topside control units with host facility systems
- Engineers who plan subsea distribution, jumpers and flying leads
- Engineers who witness factory, integration and offshore commissioning tests

An operator subsea controls group or a supplier interface team gains most when its controls, umbilical and commissioning engineers attend together.

Subsea Control Module and Umbilical Design Capabilities

Participants practise tracing each well function from the host control room through the umbilical to the valve actuator on the tree.

- Weigh direct hydraulic, piloted hydraulic and electro-hydraulic multiplexed control — architecture selection
- Calculate indicative hydraulic response times and electrical voltage drop along an umbilical — tie-back feasibility
- Specify umbilical cross-section content with spare tubes and cores — future well additions
- Design a subsea distribution layout using termination assemblies and flying leads — installation contractors
- Align topside control unit, power unit and chemical injection interfaces — host facility engineers

- Build a test sequence from factory acceptance through offshore commissioning — commissioning leads

Key Subsea Control Module and Umbilical Design Terms

- Subsea control module — a retrievable unit on the tree that holds the electronics and directional valves operating each actuator.
- Umbilical — a bundled line carrying hydraulic fluid, chemicals, electrical power and signals between the host and subsea equipment.
- Electro-hydraulic multiplexed control — a system that sends coded electrical commands to open hydraulic valves locally on the seabed.
- Hydraulic power unit — topside equipment that supplies filtered, pressurised control fluid to the umbilical.
- Umbilical termination assembly — the seabed end structure where umbilical tubes and cores are split for distribution.
- Flying lead — a short flexible jumper connecting a termination assembly to a tree or manifold.

Subsea Control Module and Umbilical Design Day by Day

Day 1: Field Architecture and Control Philosophy

- Subsea Field Layouts and Well Counts — Control Architecture Drivers
- Direct, Piloted and Multiplexed Control Options — Philosophy Selection
- Safety Shutdown and Valve Fail-Safe Logic — Response Time Targets
- Function Lists for Trees and Manifolds — Tube and Core Counts
- Control Philosophy Document — Agreement Between Operator and Supplier

Day 2: Topside Control Units and Power

- Master Control Station Functions — Operator Interface and Alarm Handling
- Hydraulic Power Unit Sizing and Fluid Cleanliness — Supply Pressure Choices
- Electrical Power Unit and Communication Modems — Signal Path Design
- Chemical Injection Supply and Metering — Flow Assurance Interfaces
- Host Facility Integration and Shutdown Links — Interface Register Content

Day 3: Umbilical Cross-Section Design

- Steel Tube, Thermoplastic Hose and Electrical Core Choices — Cross-Section Layout
- Hydraulic Response and Voltage Drop Estimates — Step-Out Distance Limits
- Fibre-Optic Elements and Signal Capacity — Condition Monitoring Needs
- Armour, Sheath and Weight Per Metre — Installation and Handling Limits
- Spare Function Allocation — Provision for Later Well Tie-Ins

Day 4: Subsea Control Modules, Distribution and Testing

- Subsea Control Module Internals and Retrieval — Maintenance Strategy Choices
- Termination Assemblies, Distribution Units and Flying Leads — Seabed Layout
- Wet-Mate Electrical and Hydraulic Connectors — Reliability and Intervention Trade-Offs
- Factory Acceptance and System Integration Testing — Defect Capture Before Shipment
- Offshore Commissioning and Function Testing — Handover to Operations

Day 5: Practising the Subsea Control and Umbilical Design Summary

- Case Control Philosophy — Applying Day 1 Architecture Choices
- Case Topside Interface Sheet — Applying Day 2 Power and Supply Sizing
- Case Umbilical Cross-Section — Applying Day 3 Response and Spare Checks
- Case Test and Commissioning Sequence — Applying Day 4 Methods
- Subsea Control and Umbilical Design Summary — Completed for Peer Review

Applying Subsea Control Module and Umbilical Design After the Course

- Lead a function list review for a planned tie-back and confirm tube, core and spare allocation in the umbilical.
- Run a response time and voltage drop check on an existing step-out and record the margin left for new wells.

Subsea Control Module and Umbilical Design Questions FAQ

What is subsea control module and umbilical design, and why does it matter now?

Subsea control module and umbilical design is the engineering of how subsea valves are commanded and supplied from a host. It matters now because longer tie-backs and more monitored wells strain response times and cross-section space.

Which roles gain most from subsea control module and umbilical design?

Subsea controls and umbilical engineers gain most, along with interface and commissioning engineers.

How does subsea control module and umbilical design differ from a control room or telemetry course?

Subsea control module and umbilical design covers seabed control hardware, umbilical cross-sections and their testing. A control room or telemetry course concentrates on onshore or topside supervision rather than the subsea equipment itself.

What do you bring back from subsea control module and umbilical design?

You bring back a control philosophy, a topside interface sheet, an umbilical cross-section and a test sequence, joined into one design summary built on a case tie-back.

Subsea Control Module and Umbilical Design: The Way Forward

The subsea control and umbilical design summary gives operator and supplier one agreed picture of functions, cross-section and tests. Its first use is freezing the umbilical specification before manufacture; controls, interface and commissioning engineers then work from it. After first use, revisit the spare function allocation whenever a new well tie-in is proposed.