Subsea Engineering Competency Profile

SUBSEA CONTROL SYSTEM DESIGN ELECTIVE	SC-002
This competency demonstrates a subsea engineer has expert knowledge of the processes and activities undertaken to specify and design control systems and associated tooling.	

ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	TYPICAL EXAMPLES OF EVIDENCE Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence
Expert knowledge of: • The technical specification and design of subsea control systems, workover control systems and associated tooling, and interfacing with relevant topside control systems • Relevant international standards associated with the design of control systems and tooling • Assembly and sub-component design and how each interacts within the control system, including flying leads, electronic modules, valves, connectors, flow meters and other sensors and instrumentation • Hydraulic design principles and methods • Electrical and fibre optic flying lead and connector design principles and methods • Topside hardware and software requirements and designs including communications protocols • Topside initiated shut down logic including, production and emergency • The impact of design upon the performance of the product during manufacture, testing, installation, commissioning and operation	Delivers comprehensive design of control systems at FEED and Detailed Design. Capable of: • Preparing, reviewing and approving technical specifications for direct hydraulic, electro-hydraulic and electrical control systems • Leading design reviews related to control systems • Managing interfaces external to the control system • Participating in risk analyses for subsea facilities, including HAZIDs and HAZOPs • Specifying purchase and / or manufacture requirements for products and components • Compliance with quality assurance requirements • Specifying test methods for control systems, interpreting test results and performing troubleshooting • Identifying risks and opportunities and developing technical solutions to improve the performance of control systems	Can describe the design process for control systems and the key drivers for different designs and how they interact with the overall system. Has participated in two or more projects representing either the manufacturer's or client's perspective. Has led a FEED or a detail design process for a control system

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• Mitigation and management of obsolescence • Design qualification, verification and validation requirements and methods Working knowledge of: • International standards relating to lifting, welding, coating and painting, cathodic protection and quality assurance • ROV interfaces, diver access and operations • Risk assessment methods • Resolution of manufacturing defects and errors • Limitations and compatibility of key materials and fluids • Destructive and non-destructive testing of components and assemblies • Methods of handling, packing and transport available and the associated advantages and disadvantages • Quality control management systems and requirements	• Providing technical support during manufacture, system testing, installation, commissioning and operation • Participate in root cause failure analysis and feedback learnings into product design and manufacture	