Subsea Engineering Competency Profile

STRUCTURAL MANUFACTURING METHODS, TESTING AND QUALIFICATION	SSS-003

This competency demonstrates the subsea engineer has sufficient knowledge and experience to effectively and successfully participate in or supervise or approve the manufacture and testing of subsea structures.

In this context subsea structures includes such things as: temporary installation aids, manifolds, in-line structures, termination units, gravity bases, moorings or foundations and protection frames.

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 manufacture, fabrication, assembly and testing of subsea structures • Quality control systems applicable to the manufacture, testing and preparation for transport • Relevant national and international standards associated with the manufacture and testing of subsea structures • The functional role of components and how they interact within the assembly • Resolution of manufacturing defects and errors • The impact that manufacturing and testing has upon the performance of the product during the design, installation and operation phases • Manufacturing methods and their limitations with respect to the materials used	The subsea engineer shall be capable of: • Describing in detail the processes to manufacture the equipment from raw materials and components through to final assembly, test and loadout. • Critically reviewing fabrication drawings and specifications • Rapid identification and high-level screening of manufacturing processes, testing requirements and integration testing • Identifying risks, opportunities, drivers and barriers associated with subsea structure manufacturing and testing • Influencing manufacturing and testing philosophy of the structure interfaces and functional requirements • Interpretation of test results including dimensional and functional checks and their adherence to acceptance criteria	Has experience as a team member or supervising the manufacturing and testing of subsea structures representing either the manufacturer or client. This includes: • Qualification, validation and verification activities. • Risk based assessments of manufacturing activities. • Materials planning and fabrication scheduling. • Key manufacturing activities. • Manufacturing quality control including materials traceability and identification and resolution of non-conformances. • Painting and corrosion protection • Testing activities including system integration testing

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Working knowledge of: • International standards relating to structure design, lifting, welding, coating, painting, cathodic protection and quality assurance • The key materials available and their limitations • Manufacturing planning, process reviews and improvement • Destructive and non-destructive methods for testing components and assemblies • The preservation, handling, transportation, installation and commissioning of subsea structures • The impact of manufacturing methods on safety and environment • Site integration testing requirements which addresses ROV and diver access and interface requirements	• Development of integration test plans, quality control requirements and manufacturing specifications • Identifying which aspects of the structure manufacturing & testing process can be modified to reduce commercial, schedule, operating and installation risk • Understanding the manufacturing and testing interfaces which must be managed to deliver an approved structure that is ready for integration into the subsea system • Understanding industry standard traceability requirements for materials • Understanding industry standard traceability requirements for the manufacturing process	