



Subsea Engineering Competency Profile

FLEXIBLE FLOWLINE, UMBILICAL AND CABLE FUNDAMENTALS

URF-001

This competency demonstrates a subsea engineer has a broad understanding of the design and manufacture of static and dynamic flexible products, including flowlines, umbilicals, cables and flying leads, and how each product interacts with its environment, the surface facilities and the subsea equipment.

ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	TYPICAL EXAMPLES OF EVIDENCE
<p>Working knowledge of:</p> <ul style="list-style-type: none"> ● Relevant international standards associated with flexible products ● The design, manufacture and testing of flexible products ● The load-out, installation, tie in and commissioning of flexible products and appurtenances ● The functional role of each structural layer in flexible products ● The functional role of umbilical cross section components ● The in-service performance of the assembled product and each component, fault conditions, failure modes and their design solutions ● The selection, design, manufacture and installation of end fittings and appurtenances including connectors, bend stiffener connectors, buoyancy modules and clamps ● The purpose of dynamic, fatigue and stability analyses and how these drive product design ● Manufacturing methods and the impact that manufacturing and testing has upon the 	<p>Capable of:</p> <ul style="list-style-type: none"> ● Identifying and using applicable international standards ● Describing the range of flexible product designs, key features and attributes ● Originating engineering deliverables related to flexible products ● Working in a multi-discipline project team to design, manufacture, test, install and commission flexible products ● Describing the processes to design, manufacture, test, install and commission flexible products ● Describing typical failure modes of flexible products including bird caging, fatigue, burst, collapse, water ingress and electrical degradation 	<p>Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence</p> <p>Has experience with at least two projects working with the design and manufacture of flexible products</p> <p>Can cite examples of where flexible product designs and operations have been implemented successfully within projects and demonstrate examples of interaction with other engineering disciplines to achieve this outcome</p>



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ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	TYPICAL EXAMPLES OF EVIDENCE
<p>performance of the product during the design, installation, commissioning and operation phases</p> <ul style="list-style-type: none">• The methods of handling, packing and transport available and the associated advantages and challenges• The key materials options and their limitations <p>Awareness of:</p> <ul style="list-style-type: none">• Quality control management systems applicable to the manufacture, test and load-out of products• Integrity envelopes• Inspection, Maintenance and Repair techniques• Vendors, their product capabilities and their limitations		<p>Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence</p>