



# Subsea Engineering Competency Profile



## SUBSEA TREE AND TOOLING MECHANICAL DESIGN ELECTIVE

**ME-002**

This competency demonstrates a subsea engineer to have a working knowledge of the processes and activities which must be undertaken to specify and mechanically design a subsea tree and its associated tooling.

ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	TYPICAL EXAMPLES OF EVIDENCE
<p>Working knowledge of:</p> <ul style="list-style-type: none"> <li>• The technical specification and mechanical design of subsea trees and associated structures and tooling.</li> <li>• Relevant international standards associated with the design of subsea trees and tooling.</li> <li>• Assembly and sub-component design and how each interacts, including control systems, jumpers, chokes, valves, connectors, flow meters and other sensors and instrumentation.</li> <li>• Hydraulic design principles and methods.</li> <li>• The impact of design upon the performance of the product during manufacture, testing, installation, commissioning and operation, including the effects of hydrostatic head</li> <li>• Design qualification, verification and validation requirements and methods.</li> <li>• Production and reservoir isolations and barrier proving</li> </ul>	<p>Can deliver design elements of subsea trees at FEED and Detailed Design.</p> <p>Capable of at least 5 of the following items:</p> <ul style="list-style-type: none"> <li>• Preparing or reviewing technical specifications for subsea trees including, horizontal and vertical layouts, guideline and guideline-less configurations.</li> <li>• Contributes to design reviews related to subsea trees.</li> <li>• Preparing or reviewing installation and workover procedures.</li> <li>• Controlling interfaces external to the subsea tree, including control systems, wellheads, jumpers or templates, and rigs and vessels.</li> <li>• Participating in risk analyses for subsea facilities, including HAZIDs and HAZOPs.</li> <li>• Specifying purchase and / or manufacture requirements for products and components.</li> <li>• Specifying quality assurance requirements.</li> <li>• Specifying test methods for subsea trees and tools, interpreting test results and performing troubleshooting.</li> </ul>	<p>Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence</p> <p>Can describe the design process for subsea trees and the key drivers for different designs.</p> <p>Has worked in the FEED or detail design process for subsea trees representing either the manufacturer's or client's perspective.</p>



# Subsea Engineering Competency Profile



<b>ELEMENT OF COMPETENCE</b>	<b>WHAT THIS COMPETENCE MEANS IN PRACTICE</b>	<b>TYPICAL EXAMPLES OF EVIDENCE</b>
<p>Awareness of:</p> <ul style="list-style-type: none"> <li>● International standards relating to lifting, welding, coating and painting, cathodic protection and quality assurance.</li> <li>● ROV interfaces, diver accessibility and operations.</li> <li>● Installation, workover and retrieval operations for subsea trees</li> <li>● Control systems and wellhead systems.</li> <li>● Diverless connection systems</li> <li>● Risk assessment methods.</li> <li>● Resolution of manufacturing defects and errors.</li> <li>● The key materials available and their limitations, including austenitic and duplex steels, polymers, elastomers, carbon steel and structural steel.</li> <li>● Destructive and non-destructive testing of components and assemblies.</li> <li>● Methods of handling, packing and transport available and the associated advantages and disadvantages.</li> <li>● Quality control management systems and requirements.</li> <li>● Flow assurance and the effects on tree design including chemical dosing requirements</li> <li>● Human factors in design</li> </ul>	<ul style="list-style-type: none"> <li>● Identifying risks and opportunities and developing technical solutions to improve the performance of subsea trees and production systems.</li> <li>● Providing technical support during manufacture, installation / retrieval, commissioning and operation.</li> </ul>	<p>Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence</p>