



Subsea Engineering Competency Profile

PROCESS ENGINEERING AND FLOW ASSURANCE FUNDAMENTALS

FDP-003

This competency enables a subsea engineer to effectively interface with or be a part of the flow assurance or process engineering team(s) to interpret results from process engineering and flow assurance engineering and use those results to design subsea equipment and define the subsea equipment's operating and integrity limits as they change through field life.

ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	INDICATORS OF ATTAINMENT
<p>Working Knowledge of Flow Assurance principles including:</p> <ul style="list-style-type: none"> • Basic fluid mechanics: single phase and multiphase flow behaviour including concepts of phase slip and liquid holdup • Wet and dry fluids, sources of water, effects of water (e.g. condensation, corrosion) and strategies for dealing with water (e.g. coolers, water removal process facilities). • Hydrate management strategies such as thermal management, thermodynamic inhibitors, kinetic inhibitors, chemical injection, and flow / pressure management. • Other common flow assurance challenges, including scale, wax, asphaltenes, emulsions corrosion considerations and erosion • Flow assurance considerations for field layout design including terrain-induced slugging, avoidance of dead leg hydrate risks • the key uncertainties in flow assurance assessments, such that adequate design margins are communicated and applied to the subsea equipment and flowlines 	<p>Capable of interfacing effectively with flow assurance engineers and facilities process engineers to obtain relevant engineering input data.</p> <p>Recognises the respective uncertainties in the design and operation of subsea systems.</p> <p>Capable of identifying flow assurance and/or process design issues that can affect the design or operation of a subsea system and ensuring that those issues are addressed.</p> <p>Identifies when it is necessary and appropriate to refer to flow assurance engineers, facilities process design engineers or related specialists.</p> <p>Capable of high level definition of flow assurance engineering work scopes.</p>	<p>Has interfaced with, or been part of a team of flow assurance engineers and/or facilities process engineers on two or more projects, including at least one multiphase project</p>



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ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	INDICATORS OF ATTAINMENT
<ul style="list-style-type: none"> • Awareness of subsea equipment dynamic loads arising from flow assurance phenomena <p>Working Knowledge of Process Engineering principles including:</p> <ul style="list-style-type: none"> • Key terminology in process engineering design standards and recommended practices and how they relate to corresponding subsea design codes' terminology • Facility pressure protection systems and their impacts on subsea system design (and incidental) pressure • Competing drivers between processing facility and subsea designs including the incremental costs of dehydration facilities vs wet service subsea systems and the incremental costs of compression versus pipeline size • The key uncertainties and assumptions made in process engineering assessments such that adequate design margins are applied to the subsea equipment and flowlines • Process facility water content specifications, including the concepts of "dry" multiphase fluids and "net dry" multiphase fluids and their impacts on subsea systems • Safety critical elements (SCEs) in the subsea system including subsea isolation valves and riser emergency shutdown valves 		