



Subsea Engineering Competency Profile

FLEXIBLE FLOWLINE AND RISER DESIGN ELECTIVE

URF-002

This competency demonstrates a subsea engineer has expert knowledge of the processes and activities which must be undertaken to specify and design flexible flowlines and risers.

| ELEMENT OF COMPETENCE | WHAT THIS COMPETENCE MEANS IN PRACTICE | TYPICAL EXAMPLES OF EVIDENCE |
|--|---|--|
| <p>Expert knowledge of:</p> <ul style="list-style-type: none"> The technical specification and design of flexible products including current material, depth, diameter and pressure limitations Relevant international standards associated with the design of flexible products The functional role of each structural layer in the product and how they interact The impact of design upon the performance of the product during manufacture, testing, installation, commissioning and operation Design qualification, verification and validation requirements and methods Factory acceptance test requirements The design of end fittings and appurtenances including connectors, bend stiffeners, buoyancy modules and clamps <p>Working knowledge of:</p> <ul style="list-style-type: none"> Riser configuration pros and cons Dynamic, fatigue and vortex induced vibration analyses | <ul style="list-style-type: none"> Delivers comprehensive design of flexible products at FEED and Detailed Design. <p>Capable of:</p> <ul style="list-style-type: none"> Preparing, reviewing and approving technical specifications for flexible products. Completing FEED and detail design for flexible products Describing advanced failure modes of flexible products including singing risers, reverse end cap effect, external sheath damage, pull-out of sheath in end fittings. Selecting appropriate design cases for analysis Leading design reviews related to flexible products Specifying purchase and / or manufacture requirements for products and components Specifying quality assurance requirements Specifying test methods for flexible products, interpreting test results and performing troubleshooting | <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 flexible products and the key drivers for different designs.</p> <p>Has led the FEED and detail design process for flexible products in more than two projects representing either the manufacturer's or client's perspective.</p> |



ENGINEERS
AUSTRALIA

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| ELEMENT OF COMPETENCE | WHAT THIS COMPETENCE MEANS IN PRACTICE | TYPICAL EXAMPLES OF EVIDENCE |
|--|--|--|
| <ul style="list-style-type: none"> • Flowline seabed stability analysis • Material selection, corrosion protection and carcass erosion assessments • 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 • Service life assessment and integrity management • In service fault and failure mechanisms and associated design solutions • Relevant international standards associated with the manufacture of flexible products <p>Awareness of:</p> <ul style="list-style-type: none"> • Vendors, their product capabilities and their limitations | <ul style="list-style-type: none"> • Identifying risks and opportunities and developing technical solutions to improve the performance of flexible products • Providing technical support during manufacture, installation and operation | <p>Refer to only as many Indicators of Attainment as you need to demonstrate the Element of Competence</p> |