

# Subsea Engineering Competency Project

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# Subsea Engineering

- Subsea Engineering Competency Framework
- CPEng (Subsea)
- NER (Subsea)

# Subsea Engineering

## Subsea Engineering Competency Framework

- Career roadmap for individuals wanting to become Subsea Engineers
- Collaboration within industry to define the relevant areas of competency
- Competency = Knowledge & Experience

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- Employer in-house competency frameworks where they exist vary in quality and application and tend not to be transferable
- Provide an industry accepted framework to align your training and work experience
- Be transportable across the industry and between employers

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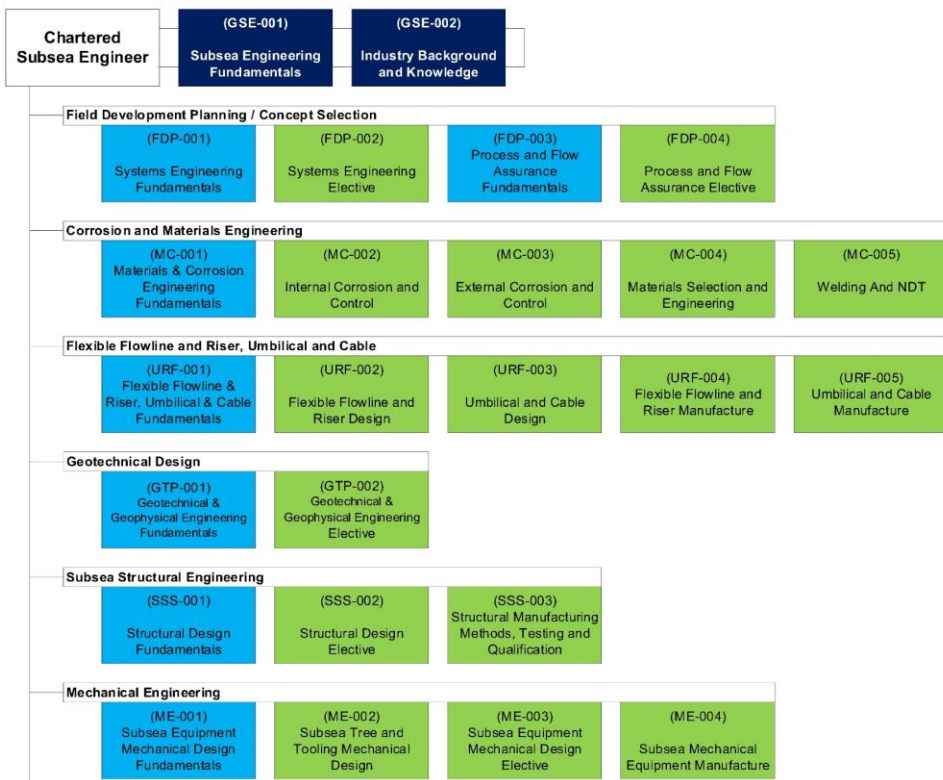
## CPEng (Subsea)

- CPEng assessment by EA
- SUT will support assessment with SME's to review the technical aspects of submission
- Professional interview facilitated by EA and supported by Subsea Engineering SME's

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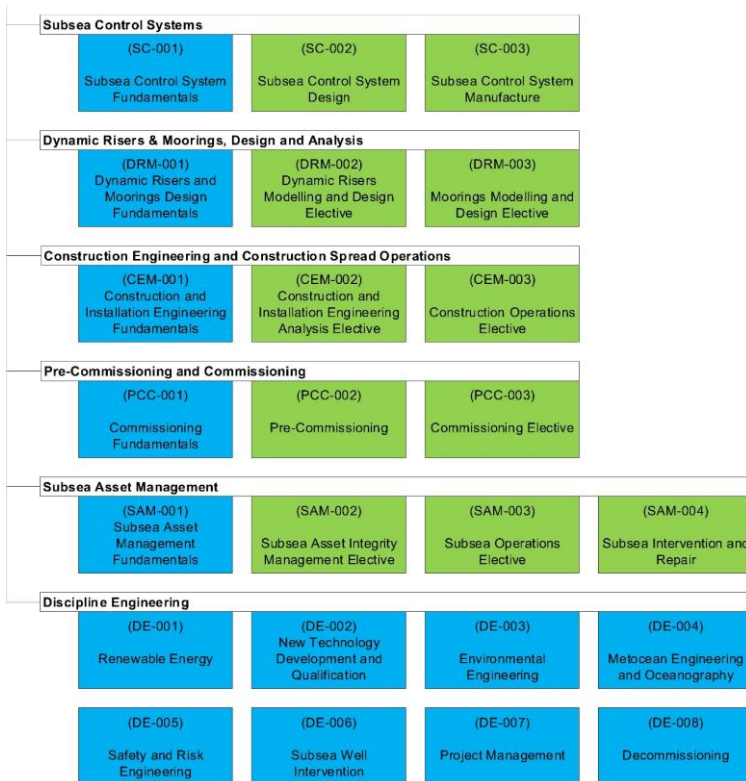
- Assessment in non-technical competencies
- Competent in min. of 5 fundamental profiles
- Competent in min. of 1 elective profiles
- Satisfactory completion of a Chartered interview

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- Mandatory Competency Element
- Fundamental Competency Element
- Elective Competency Element

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## Subsea Engineering Competency Profile



ELEMENTS OF COMPETENCE	SUBSEA ASSET MANAGEMENT FUNDAMENTALS	SAM-001
<p>This competency requires a subsea engineer to have a broad understanding of:</p> <ul style="list-style-type: none"><li>• The issues arising from the degradation of subsea facilities due to the application of damage mechanisms from the environment, the process streams and corrosion</li><li>• The methods of monitoring and inspecting equipment</li><li>• The methods for determination of fitness for purpose and ongoing management of integrity and operational limits throughout the lifecycle of the facilities</li><li>• The methods of intervention for the purposes of inspection, maintenance and repair of subsea equipment and the relative merits of different intervention platforms</li><li>• The range of operations that can be conducted on subsea equipment, throughout the life of the field into decommissioning and possible removal of the equipment</li></ul> <p>This competency enables a subsea engineer to recognise typical issues that can arise during long term operation of subsea equipment and the methods to limit the onset of damage.</p> <ul style="list-style-type: none"><li>• The subsea engineer will be able to understand the principles of ongoing fitness for purpose assessments of installed equipment</li><li>• The subsea engineer understands the principles of risk based strategies and methods to support operations with inspection, maintenance and repair activities</li><li>• The subsea engineer understands the relative advantages and disadvantages of different intervention methods</li></ul>		

ELEMENT OF COMPETENCE	WHAT THIS COMPETENCE MEANS IN PRACTICE	TYPICAL EXAMPLES OF EVIDENCE
Has the pre-requisite competency elements identified in "Competency Framework Prerequisite Map".	-	-
Knowledge of the operational threats to subsea equipment: <ul style="list-style-type: none"><li>• Environmental, Corrosion and External threats</li><li>• Damage Mechanisms</li><li>• Condition Assessments</li></ul>	Can identify typical issues that arise during long term operation of subsea equipment and define methods to limit the onset of damage.  Capable of identifying typical threats and damage mechanisms that are acting on a system of subsea facilities.	Has interfaced with operations teams managing operating subsea equipment.
Knowledge of corrosion, inspection, monitoring and repair techniques:	Capable of interpreting fitness for service assessments on subsea equipment.	Applies the principles of ongoing fitness for purpose assessments of installed equipment in an operational environment.

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<ul style="list-style-type: none"> <li>Non-destructive testing, inspection and monitoring methods</li> <li>Corrosion assessment and measurement methods</li> <li>Relative merits of various inspection and monitoring techniques</li> </ul>		
<p>Knowledge of <u>risk based</u> techniques including:</p> <ul style="list-style-type: none"> <li>Quantitative and qualitative risk assessment</li> <li>Fitness for purpose assessments</li> <li>Engineering assessment</li> <li>Technical risk assessment</li> <li>Consequence modelling</li> <li>Root cause analysis</li> </ul>	<p>Capable of determining the risk level of subsea equipment and the priorities for inspection utilising <u>risk based</u> inspection techniques.</p> <p>Capable of managing the root cause analysis process.</p>	<p>Applies the principles of <u>risk based</u> strategies and methods to support operations with inspection, maintenance and repair activities.</p>
<p>Knowledge of subsea intervention operations:</p> <ul style="list-style-type: none"> <li>Vessel operations</li> <li>ROV and diving operations</li> <li>Equipment, intervention tooling and the operation of same</li> <li>Pigging operations</li> <li>Decommissioning</li> </ul>	<p>Capable of the contributing to inspection, monitoring, repair, intervention and/or decommissioning engineering work scopes.</p>	<p>Has applied different intervention methods and understands their relative advantages and disadvantages.</p>
<p>Knowledge of Asset Management impact on design including:</p> <ul style="list-style-type: none"> <li>life cycle costing – CAPEX and OPEX balance</li> <li>incorporation of lessons learned from operations into the design phase</li> </ul>	<p>Capable of contributing to a life cycle cost analysis of subsea equipment.</p>	<p>Has participated in the development of CAPEX and OPEX models to support asset management strategies.</p>

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## NER (Subsea)

- EA have agreed to add the classification of Subsea Engineer on the NER
- NER driven by State Legislation
- In-place in Qld and Victoria, under consideration by WA and others

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## NER (Subsea)

- Technical competencies as for CPEng
- Assessment on Ethics, Risk and Communication
- 2 referees
- Professional interview

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## Chartered vs NER Assessment

- Same Technical Competency Assessments
- Reduced other competencies for NER
- Interview

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## Acknowledgements

- The SUT project team; Rex Hubbard, Mark Casey, Chris Merrick, Matt Moore, Norman O'Rourke, Ian Wilson
- The authors and peer reviewers of competency profiles
- Glen Crawley, Registrar, EA Canberra
- Pat Arundell, National Manager Chartered Assessment, EA Melbourne

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- Questions

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<https://www.sut.org/branch/australia-perth/furtherdevelopment/>