Subsea Engineering Competency Profile

**RENEWABLE ENERGY ELECTIVE**

This competency demonstrates a subsea engineer has expert knowledge of the design, construction, installation and operation of renewable energy devices.

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| Expert Knowledge of the design, construction, installation and operation of renewable energy devices including:  
  - Metocean Hydrodynamics  
  - Mechanical, Geotechnical and Structural Design  
  - Energy Capture, Storage and Offtake  
  - Electrical Design, Cable Design  
  - Maintenance and Repair  
  - Marine and Seabed Environments | Can predict the physical limits of a device, determine power output, develop interconnected arrays and understands how devices are installed.  
  - Understands the requirements for stability of seabed structural foundations.  
  - Understands the implications of different electrical design parameters including: AC vs DC equipment, balancing intermittent generation, cable operational limit states and energy export.  
  - Designs and installs renewable energy infrastructure with due regard for other stakeholders, third party interaction and the marine environment. | Has worked on at least one field-deployed demonstration or commercial-scale renewable energy capture device.  
  - Has worked on the design of, or the installation and shore connection or operation of a renewable energy project.  
  - Can describe in detail the maintenance and operation of particular renewable energy devices including their characteristic failure modes. |
| Expert Knowledge of how arrays of renewable devices are designed, constructed, and connected. | Can size and layout arrays, integrating wake recovery and downstream turbulence, for optimal power capture and efficiency. | Has worked on the design of, or the installation and shore connection of, a renewable energy project with arrays of devices. |
| Knowledge of the business case for the application of particular types of renewable energy devices. | Can select between deployment options, advantages and disadvantages and selection criteria. | Has performed at least two renewable energy resource assessments including seasonal and inter-annual variability. |