

**SKILLS FRAMEWORK FOR MARINE AND OFFSHORE  
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

<b>TSC Category</b>	Product Finalisation					
<b>TSC</b>	Installation Planning and Execution					
<b>TSC Description</b>	Create suitable foundations and connections among dependent machineries on board ships, rigs and/or conversions according to product specifications and manufacturers' recommendations in alignment with technical drawings					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
	<b>MAR-PFI-1002-1.1</b>	<b>MAR-PFI-2002-1.1</b>	<b>MAR-PFI-3002-1.1</b>	<b>MAR-PFI-4002-1.1</b>		
	Carry out installation of components and equipment on ships, rigs and/or conversions involving minimal machine support	Execute installation of machinery equipment, ship systems and other complex structures requiring the application of chocks, foundation supports, vibration dampers and other installation techniques	Establish installation methods for specific machinery, equipment and/or systems	Develop technical installation plans by reviewing load calculation for base supports, time and resource requirements and procedures for executing selected methods of installation		
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>Types and components of technical drawings</li> <li>Types of installation tools</li> <li>Tools and techniques required to carry out installation</li> <li>Calibration procedures for tools</li> <li>Measurement standards to be followed</li> <li>Applications of installation techniques</li> <li>Installation plans</li> <li>Types of ships and rigs, terminologies and features</li> <li>Types of equipment and systems for installation on ships and rigs</li> </ul>	<ul style="list-style-type: none"> <li>Chocking, buffering and other techniques of installation</li> <li>Types of machinery operation on ships, rigs and/or conversions</li> <li>Types of vibration dampening techniques</li> <li>Specialised tools for shaft alignment and other installation work</li> <li>Interdependencies with other equipment and systems</li> <li>Relevant workplace safety and health (WSH) practices, guidelines and regulations</li> <li>Relevant quality assurance and quality control (QA/QC) policies and procedures</li> </ul>	<ul style="list-style-type: none"> <li>Components of equipment drawings and technical specification sheets</li> <li>Technical installation plans</li> <li>Types, procedures benefits and limitations of equipment installation techniques</li> <li>Vibrations, heat radiation and other operating conditions of equipment and systems</li> <li>Thermal analysis</li> <li>Vibration analysis</li> </ul>	<ul style="list-style-type: none"> <li>Naval architecture calculations</li> <li>Methods of monitoring condition of foundations during installation operations</li> <li>Types of sensors to measure vibrations and deterioration of foundations</li> <li>Safety precautions to be observed during installations</li> <li>Relevant quality assurance and quality control (QA/QC) policies and procedures</li> </ul>		

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<p><b>Abilities</b></p>	<ul style="list-style-type: none"> <li>• Infer installation locations from structural and arrangement drawings, equipment specification sheets and electrical drawings</li> <li>• Interpret installation plans</li> <li>• Set up and calibrate installation tools</li> <li>• Execute installation techniques</li> <li>• Interpret prescribed tolerances and measurements in equipment installations</li> <li>• Calibrate tools and installation equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiate load bearing members from non-load bearing members and infer other complex details</li> <li>• Infer connection requirements for power supply and with other marine equipment and systems in accordance with design specifications</li> <li>• Operate installation tools for chocks, foundation supports, vibration dampers and other techniques</li> <li>• Identify equipment defects and installation problems during installation process</li> </ul>	<ul style="list-style-type: none"> <li>• Infer installation requirements from equipment dimensions, equipment operating conditions and structural and arrangement drawings</li> <li>• Carry out vibration analyses on test beds</li> <li>• Carry out thermal analyses on test beds</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out feasibility analyses on installation methods</li> <li>• Infer proximity to auxiliaries and power sources from technical drawings</li> <li>• Cross-reference naval architectural data and equipment specifications to determine load bearing capacities</li> <li>• Provide detailed installation procedures to production departments</li> <li>• Verify performance test results</li> </ul>		
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