

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

TSC Category	Marine Engineering					
TSC	Naval Architecture Calculations					
TSC Description	Apply mathematical and physics calculations to specify capacity, trim and stability details, and ensure seaworthiness of ships					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			STP-MCA-3002-1.1	STP-MCA-4002-1.1	STP-MCA-5002-1.1	
			Produce line plans and drawings from offset tables and collate data for form and stability calculations	Calculate ship stability based on design and construction, and solve floatation-related problems	Review naval architecture calculations to determine safe operational limits of ships and/or rigs under different weather and load conditions	
Knowledge			<ul style="list-style-type: none"> • Basic principles of naval architecture • Ship, rig and/or conversion design nomenclatures and terminologies used in line plan drawings • Relationship between offset tables and line plan drawings • Relationship between water lines, station lines and buttock lines • Calculations of water plane areas, underwater volumes and displacements • Types of coefficients of fineness • Types of stability, their definitions and factors of consideration • Procedures for conducting inclining experiments • The International Convention for the Safety of Life at Sea (SOLAS), International 	<ul style="list-style-type: none"> • Advanced concepts of naval architecture • Types of ships, layouts and functions • Techniques of numerical analysis relevant to naval architecture calculations • Procedures for developing hydrostatic and hydrodynamic curves for ships, rigs and/or conversions • Procedures for calculating stresses on ships, rigs and/or conversions • Impact of sea, weather and load on ships, rigs and/or conversions • Functions of ships, rigs and/or conversions' structural components • Concepts of intact stability and trim, dynamic stability and damaged stability • Ship, rig and/or conversion launching 	<ul style="list-style-type: none"> • Methods of reviewing naval architecture calculations • Methods of reviewing trim and stability booklets • The International Convention for the Safety of Life at Sea (SOLAS), International Convention for the Prevention of Pollution from Ships (MARPOL) and other International safety regulations governing naval architecture calculations and design • Methods of improving naval architecture calculation processes 	

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			<p>Convention for the Prevention of Pollution from Ships (MARPOL) and other International safety regulations governing naval architecture calculations and design</p>	<p>processes and concepts</p> <ul style="list-style-type: none"> • International Convention on Tonnage Measurement of ships • Load line assignment • The International Convention for the Safety of Life at Sea (SOLAS), International Convention for the Prevention of Pollution from Ships (MARPOL) and other International safety regulations governing naval architecture calculations and design 		
Abilities			<ul style="list-style-type: none"> • Conduct data collection relevant to the concept design • Search raw data to find relevant information • Identify anomalies in data • Create offset tables • Produce line plans from offset tables • Perform fairing and checks on the engineering drawing • Execute form and stability calculations 	<ul style="list-style-type: none"> • Execute naval architecture calculations for ships and/or rigs to determine details about capacities, trim and stability • Analyse impact of weather and load conditions on capacity, trim and stability • Determine hydrostatic and hydrodynamic curves for ships and rigs • Produce trim and stability booklets and submit for reviews 	<ul style="list-style-type: none"> • Review and certify naval architecture calculations • Review and certify trim and stability booklets • Evaluate naval architecture calculation processes and adapt as necessary • Facilitate collaborations with production team 	