

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

TSC Category	Marine and Offshore System Design					
TSC	Fuel and Lubrication System Design					
TSC Description	Design fuel and lubrication systems for propulsion, power generation and lubrication of machineries installed on ships, rigs and/or conversions including pump and piping components, storage tank designs, heat exchangers and safeties through detailed understanding of fuel and lubrication properties					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			MAR-MSD-3006-1.1	MAR-MSD-4006-1.1	MAR-MSD-5006-1.1	
			Analyse flow rates and fuel and lubrication pumping equipment capacities by retrieving data from equipment lists, equipment and pipeline drawings and executing marine engineering calculations	Develop fuel and lubrication system specification sheets and sketches by integrating information from marine engineering calculations with the types and properties of fluids to be handled and identifying the types and locations of pumping and treatment equipment to be employed	Guide the formulation of fuel and lubrication system specification sheets and sketches, approve equipment lists, position lists and calculations that are in line with the equipment manufacturers' recommendations and international regulations, and ensure that the equipment specific fuel and lubrication systems are synced with the specific ship, rig and/or conversion systems	
Knowledge			<ul style="list-style-type: none"> Principles of fluid dynamics and thermodynamics Equipment drawings and specification sheets and conventions used in system drawings Numerical computation of flow rates and fuel and lubricating requirements of equipment systems Properties and applications of different types and grades of fuels and lubrications Types and specifications of fuel and lubrication pumping equipment 	<ul style="list-style-type: none"> Methods of evaluating effectiveness of fuel and lubrication transfer systems Methods of evaluating effectiveness of fuel and lubrication purification systems Methods of evaluating effectiveness of fuel and lubrication storage systems 	<ul style="list-style-type: none"> Procedures for formulating fuel and lubrication system designs Evaluation criteria for measuring effectiveness of fuel and lubrication systems Manufacturers' recommendations and limitations Legislative requirements governing storage and handling of fuels and lubrications 	

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			<ul style="list-style-type: none"> • Types of fuel and lubrication piping configurations • Types and specifications of fuel and lubrication heat exchangers and material behaviour under varying temperatures and fuel and lubrication oils • Sensors for pressure and flow measurements • Actuators for pressure and flow regulation • Purification standards and equipment for fuels and lubrications 			
Abilities			<ul style="list-style-type: none"> • Interpret equipment drawings and specification sheets • Determine appropriate data for executing relevant fuel and lubrication system design calculations • Identify sources for retrieving relevant data • Execute accurate flow rate, tank capacity and fuel and lubrication consumption calculations • Identify suitable fuel and lubrication systems based on the type of equipment • Identify pumping specifications based on fuel and lubrication grades • Identify piping specifications based on fuel and lubrication grades 	<ul style="list-style-type: none"> • Draft fuel and lubrication system design drawings • Apply conditioning and purification techniques, based on fuel and lubrication grades to designs • Incorporate system isolation into designs based on fuel and lubrication grades • Ensure safety features meet classification rules and requirements 	<ul style="list-style-type: none"> • Design process workflows to execute fuel and lubrication system designs • Evaluate performance specification analysis on selection of sensors and actuators • Evaluate performance specification analysis on selection of pumping systems • Evaluate performance specification analysis on selection of piping specifications and configurations • Evaluate efficiency of fuel and lubrication storage and handling equipment • Evaluate application of industry standards and international conventions in drawings • Evaluate final reports on selected components 	

			<ul style="list-style-type: none">Gauge probability of system failure during operations		used to meet the system requirements	
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