

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

TSC Category	Marine Manufacturing					
TSC	Joining and Welding					
TSC Description	Fabricate components through the application of heat, pressure and/or friction to join structures together					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	MAR-MMF-1004-1.1	MAR-MMF-2004-1.1	MAR-MMF-3004-1.1			
	Execute prescribed joining and welding techniques for manufacturing of components under close supervision and in compliance with safety requirements set by the organisation	Oversee joining and welding operations on the shop floor to ensure that tasks are carried out in accordance to manufacturing workflow plans using appropriate techniques, measurement standards and materials in compliance with relevant safety parameters	Interpret equipment, structural and pipeline drawings to determine where joining and/or welding is required and evaluate various joining and welding technologies to plan work requirements			
Knowledge	<ul style="list-style-type: none"> Types of joining and welding techniques and equipment Storage, handling and use of joining and welding consumables and gases Types of filler metals Types of joint designs Methods of joint and surface preparation Types of weld defects, their implications and methods of rectification Applications of destructive and non-destructive tests and bond tests Workplace safety and health (WSH) requirements related to joining and welding works Quality assurance and quality control (QA/QC) requirements related to 	<ul style="list-style-type: none"> Joining and welding process parameters Types of joining and welding procedure specifications (WPS) and data sheets Types of joining and welding deformation characteristics Joining and welding acceptance criteria and inspection methods Types of ships and rigs, terminologies and features Principles and procedures for surface preparation Pre- and post-heat treatments Concept of stress relief in materials Methods of dimension control, corrective actions and rectifying distortion control 	<ul style="list-style-type: none"> Applications of joining and welding standards, codes and statutory requirements Mechanical and physical properties of metals Factors affecting the joining and/or welding of metals and alloys Types of ship and rig equipment and products, their functions and characteristics that joining and welding works must support Types of edge preparations Effects of welding and weld sequencing on structures 			

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	joining and welding works	<ul style="list-style-type: none"> Types of joint and weld defects 				
Abilities	<ul style="list-style-type: none"> Interpret technical drawings and specifications to extract relevant information to prepare and set up joining and welding materials and equipment Conduct pre-operational checks and inspections to verify working conditions of joining and/or welding tools and equipment according to job requirements Perform joints and surfaces preparation according to job requirements Set up joining and/or welding equipment according to safe working practices Set up components using appropriate jigs and fixtures according to job requirements Perform joining and/or welding operations and adjust appropriately to achieve required quality Rectify joining and/or welding defects using appropriate processes to meet specifications 	<ul style="list-style-type: none"> Interpret technical drawings and specifications to extract relevant information on joint requirements Develop joining and welding process plans for application Select the appropriate techniques and equipment based on joint requirements and organisational procedures Supervise joining and welding processes to ensure required solutions are achieved Evaluate joining and welding processes and advise on identified defects Assess weld quality for compliance with standards and requirements 	<ul style="list-style-type: none"> Determine joining and/or welding techniques and associated technologies to be applied based on component design and functional requirements Review design specifications, drawings and joint strength calculations to verify the suitability of chosen joining and/or welding techniques Prepare welding procedure specifications (WPS) Prepare joining and welding inspection specification plans Set up quality control procedures to address product quality and compliance to regulatory guidelines Review properties of joints and perform corrective processing 			