

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

TSC Category	Technical Drawing					
TSC	Structural and Arrangement Drawing					
TSC Description	Create structural and arrangement drawings to guide production and manufacturing processes					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		MAR-TDR-2004-1.1	MAR-TDR-3004-1.1	MAR-TDR-4004-1.1		
		Modify sections of structural and arrangement drawings to reflect changes to existing designs in line with international codes and conventions	Create full scale structural and arrangement drawings for production departments to design manufacturing workflows and for use in maintenance and repair activities during the life of ships, rigs and/or conversions	Develop new, large scale and other high complexity structural and arrangement drawings for production departments and advise on the most efficient method to create such drawings based on complexity, cost and time involvement		
Knowledge		<ul style="list-style-type: none"> Types and principles of 2D and 3D engineering drawings used in designing ships, rigs and/or conversions Types of symbols used in developing structural and arrangement drawings Relevant classification rules and other guidelines for structural and arrangement drawings Methods of interpreting structural and arrangement drawings Purpose of structural and arrangement drawings Principles of naval architecture Types of computer-aided design (CAD) software relevant to creating structural and general arrangement drawings 	<ul style="list-style-type: none"> Methods of translating project requirements into 2D and 3D equipment drawings Methods of analysing structural and arrangement drawings Advanced principles of naval architecture calculations Types of materials used in production work on ships, rigs and/or conversions Procedures in the production and manufacturing departments Principles of designing for manufacturing and assembly Concepts of prototype design Design for manufacture and assembly (DFMA) guidelines 	<ul style="list-style-type: none"> Methods of translating high complexity marine equipment project requirements into 2D and 3D structural and arrangement drawings Advanced principles of naval architecture Advanced principles of mechanical engineering International regulations related to mechanical and structural engineering Methods of evaluating structural and arrangement drawing techniques Evaluation processes and criteria for design for manufacture and assembly (DFMA) 		

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

		<ul style="list-style-type: none"> Principles of production and manufacturing workflow development Concepts of prototype design 				
Abilities		<ul style="list-style-type: none"> Interpret structural and arrangement drawings Translate and incorporate hand sketches and tracing drawings into structural and arrangement drawings and plans based on examples and references Operate CAD software to modify existing equipment drawings Apply geometric dimensions and tolerances and marine industry standards in engineering drawings Carry out basic engineering calculations pertaining to mechanical concepts Differentiate between specifications of various marine components Suggest improvements to structural and arrangement drawings Understand how structural and arrangement drawings are used in production departments 	<ul style="list-style-type: none"> Apply naval architecture and geometrical principles to concept designs Interpret clients' needs to develop specific structural and arrangement drawings Create full scale structural and arrangement drawings using appropriate 2D or 3D methods Incorporate results from naval architecture calculations in structural and arrangement drawings Incorporate details of appropriate materials for a project in drawings Comprehend electrical, pipeline and equipment drawings Follow DFMA guidelines 	<ul style="list-style-type: none"> Create new, large scale and other high complexity structural and arrangement drawings using appropriate 2D or 3D methods Translate complex project requirements into structural or arrangement drawings Review structural and arrangement drawings against international regulations and conventions and project requirements Evaluate adherence of drawings to DFMA Ensure structural and arrangement drawings do not conflict with electrical or pipeline plans Develop more efficient methods of creating structural and arrangement drawings based on complexity, cost and time involvement 		