

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

TSC Category	Technical Drawings					
TSC	Pipeline Drawings					
TSC Description	Create pipeline drawings to assist in production and maintenance activities, based on structural and arrangement drawings, equipment lists and consideration of fluids to be carried and pressure to be handled					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		MAR-TDR-2003-1.1	MAR-TDR-3003-1.1	MAR-TDR-4003-1.1		
		Modify sections of pipeline drawings to reflect changes to existing systems in alignment with international codes and conventions	Create full scale representative pipeline drawings for production departments to design manufacturing workflows and further aid in maintenance and troubleshooting of ships', rigs' and/or conversions' machinery systems during their lifecycles	Develop new, large scale and other high complexity pipeline drawings and advise on appropriate drawing methods based on complexity, cost and time involvement		
Knowledge		<ul style="list-style-type: none"> Classification rules and guidelines for structural and arrangement drawings Types and principles of 2-D and 3-D pipeline drawings used in designing ships, rigs and/or conversions Pipeline drawing symbols and conventions Methods of interpreting pipeline drawings Applications of pipeline drawings Basic principles of mechanical engineering Basic principles of fluid dynamics Types of pipeline configurations Types of computer-aided design (CAD) software relevant to 	<ul style="list-style-type: none"> Methods of translating project requirements into 2D and 3D electrical drawings Methods of analysing pipeline drawings Types of piping safety Types of piping faults Concepts in mathematics pertinent to flow rate, capacity and pressure requirements Design for manufacturing and assembly (DFMA) guidelines 	<ul style="list-style-type: none"> Methods of translating high complexity project requirements into 2D and 3D pipeline drawings Advanced principles of mechanical engineering Advanced principles of fluid dynamics International regulations pertaining to pipeline systems for different fluids Methods of interpreting detailed structural drawings Methods of evaluating pipeline drawing techniques Evaluation processes and criteria for design for manufacturing and assembly (DFMA) 		

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		<p>creating pipeline drawings</p> <ul style="list-style-type: none"> Types of pipe fittings, valves, flow monitoring equipment and adjusting equipment 				
Abilities		<ul style="list-style-type: none"> Interpret pipeline drawings Translate and incorporate hand sketches and tracing drawings into pipeline drawings and plans based on examples and references Operate CAD software to modify existing pipeline drawings Apply geometric dimensions and marine industry standards in engineering drawings Trace pipelines as per drawings Carry out basic engineering calculations pertaining to mechanical and fluid dynamic concepts Differentiate between specifications of pipeline equipment Suggest improvements to pipeline drawings 	<ul style="list-style-type: none"> Apply mechanical and fluid dynamic principles to concept designs Create full scale pipeline drawings using appropriate 2D or 3D methods based on flow rates and capacity required Employ relevant methods of numerical analysis to calculate flow rate, capacity and pressure requirements for ships, rigs and/or conversions Interpret discipline drawings to assist in analyses for pipeline planning and installation Incorporate details of appropriate materials for a project in drawings Comprehend structural and arrangement drawings Incorporate safety in drawings Follow DFMA guidelines 	<ul style="list-style-type: none"> Review and understand structural and arrangement drawings Create new, large scale and other high complexity pipeline drawings using appropriate 2D or 3D methods Translate complex project requirements into piping implications Review pipeline drawings against international regulations and conventions and project requirements Evaluate adherence of drawings to DFMA Ensure pipeline drawings and plans do not conflict with structural and power plans Develop more efficient methods of creating pipeline drawings based on complexity, cost and time involvement 		