

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

TSC Category	Technical Drawing					
TSC	Electrical Drawing					
TSC Description	Create and interpret electrical drawings based on design specifications to guide power planning and installation of electrical systems for ships, rigs and/or conversions					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		MAR-TDR-2001-1.1	MAR-TDR-3001-1.1	MAR-TDR-4001-1.1		
		Modify sections of electrical drawings to reflect changes to existing systems in line with international codes, conventions and regulations	Create full scale electrical drawings for power installations on ships, rigs and/or conversions including cable layout and switchboard schematics to aid in fault-finding and troubleshooting electrical systems	Develop and evaluate new, large-scale and other high complexity electrical system drawings and advise on optimal drawing methods to create such drawings based on complexity, cost and time involvement		
Knowledge		<ul style="list-style-type: none"> Principles of 2D and 3D engineering drawings used in designing ships, rigs and/or conversions Types of electrical drawing symbols and conventions Methods of interpreting electrical drawings Applications of electrical drawings Basic principles of electrical engineering Types and capacities of electrical installations Types of computer-aided design (CAD) software relevant to creating electrical drawings 	<ul style="list-style-type: none"> Methods of translating project requirements into 2D and 3D electrical drawings Methods of analysing electrical drawings ISO and other guidelines for engineering drawings Types and specifications of electrical cables Types and specifications of electrical equipment Types of electrical faults Methods of preventing electrical faults Concepts in mathematics pertinent to engineering calculations and power planning Design for manufacture and assembly (DFMA) guidelines 	<ul style="list-style-type: none"> International Convention for the Safety of Life at Sea (SOLAS) Chapter II-1 and International Electrotechnical Commission (IEC) codes and standards and other international regulations Methods of translating project requirements into 2D and 3D electrical drawings Advanced principles of electrical engineering International regulations related to electrical engineering Methods of interpreting detailed structural drawings Methods of evaluating electrical drawing techniques Evaluation processes and criteria for design for manufacture and assembly (DFMA) 		

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<p>Abilities</p>		<ul style="list-style-type: none"> • Interpret electrical drawings • Translate and incorporate hand sketches and tracing drawings into electrical drawings and plans based on examples and references • Operate CAD software to modify existing electrical drawings • Apply dimensioning layouts in engineering drawings • Carry out basic engineering calculations pertaining to electrical concepts • Differentiate between specifications of various electrical equipment 	<ul style="list-style-type: none"> • Apply electrical principles to concept designs • Create full scale electrical drawings using appropriate 2D or 3D methods • Employ relevant methods of numerical analysis to derive power requirements for ships, rigs and/or conversions • Interpret discipline drawings to assist in analyses for planning and installation of engineering systems • Incorporate details of appropriate materials for electrical elements of projects in drawings • Interpret structural and arrangement drawings • Incorporate electrical safety in drawings • Follow DFMA guidelines 	<ul style="list-style-type: none"> • Review and understand power plans and structural drawings • Create new, large-scale and other high complexity electrical system drawings using appropriate 2D or 3D methods • Translate complex project requirements into power planning implications • Review electrical drawings against international regulations and conventions and project requirements • Evaluate adherence of drawings to DFMA • Ensure alignment of electrical drawings to structural plans • Identify efficient methods of developing electrical drawings based on complexity, cost and time involvement 		
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