SKILLS FRAMEWORK FOR MARINE AND OFFSHORE
SKILLS MAP - SENIOR DESIGN ENGINEER

Sector	Marine and Offshore
Track	Design and Engineering
Occupation	Marine Design Engineer
Job Role	**Senior Design Engineer**
Job Role Description	The Senior Design Engineer is responsible for day-to-day designing and engineering activities, conducts market analyses and suggests technologies to be invested based on research results. He/She leads testing procedures for prototypes before they are passed to the production team. He has spent significant years on the job and acquired technical knowledge and skills relating to the design of various ship and rig components, systems and equipment. The Senior Design Engineer should possess a meticulous nature to analyse various factors and calculations involved in ship and rig design. His expertise is essential to his responsibilities to provide technical guidance to his team and lead projects of moderate complexity or less-routine in nature.

	Critical Work Functions	**Key Tasks**	**Performance Expectations (For legislated / regulated occupations)**
Critical Work Functions and Key Tasks	Develop technical drawings and design plans	Perform feasibility analysis on design plans	In accordance with: • Classification Society regulations; • Workplace Safety and Health (WSH) Act
		Review design drawings bases for practicability, completion timeframe and research capabilities	
		Incorporate equipment, system, ship, rig and/or conversion components and safety features in design plans	
	Employ advanced analytics and big data	Establish design-related hypotheses for testing through data analytics	
		Specify appropriate advanced analytical techniques to create information which supports decision-making	
		Evaluate analysis findings for technical and business reports	
		Communicate data analysis results to relevant stakeholders	
	Drive innovation and research	Implement approved green initiatives in design processes	
		Conduct research for green initiatives and other product innovations	
		Record implementation progress of innovation initiatives	
	Develop and test prototypes	Conduct tests on numerical models against fundamental design failures of prototypes	
		Coordinate mechanical and electrical tests on prototype components	
	Develop intellectual property (IP) strategy	Develop IP management processes for designs	
		Define categories for organisation's existing IP to allow ease of access to necessary information	
		Determine possible business applications of IP to support organisation's strategies and objectives	
		Evaluate IP infringements in accordance with organisational procedures	
	Manage people and organisational function	Collaborate with team members to deliver high performance	
		Develop resource planning strategies	
		Manage department's compliance to organisation's risk management framework	
		Analyse viability of workplace improvements and change management initiatives	
		Participate in negotiations with key internal and external stakeholders	
		Analyse financial implications of business strategies	

Skills & Competencies	**Technical Skills and Competencies**		**Generic Skills and Competencies (Top 5)**	
	Ballast System Design	Level 4	Problem Solving	Intermediate
	Big Data Analytics	Level 4	Teamwork	Intermediate
	Business Negotiation	Level 4	Computational Thinking	Intermediate
	Business Presentation Delivery	Level 3	Digital Literacy	Intermediate
	Cargo System Design	Level 4	Decision Making	Intermediate
	Change Management	Level 3		
	Communication and Navigation System Design	Level 4		

	Control System Programming	Level 4
	Cooling System Design	Level 4
	Crisis Management	Level 3
	Electrical Drawing	Level 4
	Emergency Response Management	Level 2
	Equipment Drawing	Level 4
	Financial Planning	Level 3
	Fuel and Lubrication System Design	Level 4
	Green Ship Design	Level 4
	Heat Transfer System Design	Level 4
	Heating, Ventilation and Air Conditioning System Design	Level 4
	Innovation Management	Level 3
	Instrumentation and Control System Design	Level 4
	Intellectual Property Management	Level 3
	Interface Management	Level 4
	Marine Design Customisation	Level 4
	Marine Engineering Calculations	Level 3
	Marine Equipment Material Selection	Level 4
	Market Research	Level 3
	Naval Architecture Calculations	Level 5
	Operational Risk Management	Level 3
	Organisational Performance Management	Level 3
	Pipeline Drawing	Level 4
	Power Generation System Design	Level 4
	Programme Management	Level 5
	Propulsion System Design	Level 4
	Pump and Piping Design	Level 4
	Quality System Management	Level 3
	Robotics and Automation Application	Level 4
	Safety System Design	Level 4
	Staff Performance Management	Level 3
	Stakeholder Management	Level 4
	Structural and Arrangement Drawing	Level 4
	System Architecture Design	Level 4
	System Configuration Management	Level 4
	Systems Integration	Level 4
	WSH Culture Development	Level 2
	WSH Performance Management	Level 2
Programme Listing	For a list of Training Programmes available for the Marine and Offshore sector, please visit: wwww.skillsfuture.sg/skills-framework/marineandoffshore	

The information contained in this document serves as a guide.