

**SKILLS FRAMEWORK FOR ENERGY AND CHEMICALS
SKILLS MAP - PRINCIPAL ENGINEER (ENGINEERING)**

Sector	Energy and Chemicals			
Track	Engineering and Maintenance			
Occupation	Engineer			
Job Role	Principal Engineer (Engineering)			
Job Role Description	<p>The Principal Engineer (Engineering) acts as a technical advisor to provide problem-solving consultation and engineering expertise for complex engineering projects. He/She manages plant asset integrity by providing technical recommendations for equipment and system degradation issues, and by integrating mitigation measures for plant and equipment assessed risks into the organisation's business continuity plan.</p>			
	<p>The Principal Engineer (Engineering) manages plant asset and equipment optimisation by leading technical investigations, tests and validations of new technology and equipment for operational excellence. He provides technical input for the development and review of the organisation's Major Hazard Installation (MHI) Safety Case, and ensures the integration of the Process Safety Management (PSM) framework into engineering projects. At the organisational level, he is responsible for translating continuous improvement strategies into actionable plans for the engineering and maintenance department, and for driving the development of technical capabilities for the engineering team, so as to ensure optimum technical support for assuring plant asset and equipment performance.</p>			
	<p>The Principal Engineer (Engineering) is a key resource person who advises senior management, engineering groups (both internal and external), the production and process engineering department, and the Health, Safety and Environment (HSE) department on engineering matters. He is highly analytical, enjoys solving challenging problems, and is able to lead others effectively. He is expected to possess strong project management, transdisciplinary and decision-making skills.</p>			
Critical Work Functions and Key Tasks	Critical Work Functions		Key Tasks	
	Administer Workplace Safety and Health (WSH) and Environmental Management Systems (EMS)		Ensure compliance with WSH and EMS systems at the department level	
			Provide technical input for the development and review of the organisation's Major Hazard Installation (MHI) Safety Case	
	Administer Process Safety Management (PSM) systems		Drive the implementation of PSM frameworks and their integration into engineering projects	
	Manage engineering projects		Act as technical advisor for complex engineering projects to ensure compliance with engineering standards	
			Critique technical documents for equipment operation and maintenance to ensure optimal reliability and integrity of equipment	
			Identify significant technical deviations from design to warrant change-out or major overhaul of equipment and/or systems	
			Lead process safety reviews for plant operation, Management of Change (MOC) projects and new projects	
			Share best practices in the implementation of engineering standards and design	
	Manage asset integrity		Act as technical advisor for the continuous improvement of asset integrity management systems	
			Lead the implementation of equipment and systems value engineering	
			Provide technical recommendations for equipment and system degradation issues to enhance plant reliability and availability	
			Validate plant and equipment risk analysis reports and integrate mitigation measures into business continuity plans	
	Manage equipment automation and optimisation		Drive the optimisation of process equipment reliability and availability	
			Lead technical investigations, tests and validations of new technologies and equipment for operational excellence	
		Provide engineering guidance and oversight to various departments to achieve best value engineering solutions		
		Recommend technologies and techniques that enhance the efficiency and effectiveness of production and maintenance activities		
		Synthesise data across entire plants for equipment integration and optimisation		
Administer staff and organisational development		Build in-house technical capabilities for the engineering team		
		Contribute to the development of business continuity plans		
		Drive the adoption of technologies to support virtual collaboration in remote locations		
		Translate continuous improvement strategies into actionable plans		
Skills & Competencies	Technical Skills and Competencies		Generic Skills and Competencies (Top 5)	
	Asset Integrity Management	Level 5	Leadership	Advanced
	Business Continuity Management	Level 5	Global Mindset	Advanced
	Business Networking Management	Level 5	Developing People	Advanced
	Change Management	Level 5	Problem Solving	Advanced
	Commissioning and Start-Up Management	Level 5	Decision Making	Advanced
	Continuing Professional Development Management	Level 5		
	Continuous Improvement Management	Level 6		
Data Analytics System Design	Level 4			

Skills & Competencies	Data and Statistical Analytics	Level 5
	Electrical Engineering Management	Level 5
	Engineering Drawing Interpretation and Management	Level 5
	Engineering Management of Change	Level 5
	Engineering Project Management	Level 5
	Engineering Safety Standards Interpretation	Level 5
	Engineering Support Management	Level 5
	Engineering, Procurement and Construction Management	Level 5
	Environmental Management System Framework Development and Implementation	Level 4
	Equipment and System Value Engineering Management	Level 5
	Front-End Engineering Design Management	Level 5
	Inspection Engineering Management	Level 6
	Instrumentation and Control Design Engineering Management	Level 5
	Internet of Things Management	Level 5
	Maintenance Integrity and Reliability Framework Development and Implementation	Level 5
	Major Hazard Installation Safety Case Management	Level 5
	Mechanical Rotating Equipment Engineering Management	Level 5
	Mechanical Static Equipment Engineering Management	Level 5
	Plant Turnaround Management	Level 5
	Preventive Maintenance Management	Level 6
	Process Safety Management Framework Development and Implementation	Level 5
	Project Management	Level 6
	Reliability Engineering Management	Level 5
	Robotic and Automation System Maintenance	Level 5
Robotic and Automation Technology Application	Level 5	
Technical Presentation	Level 6	
Technical Report Writing	Level 4	
Technology Road Mapping	Level 5	
Workplace Safety and Health Framework Development and Implementation	Level 4	
Programme Listing	For a list of Training Programmes available for the Energy and Chemicals sector, please visit: www.skillsfuture.sg/skills-framework/energyandchemicals	

The information contained in this document serves as a guide.