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

Sector	**Energy and Chemicals**
Track	**Production and Process Engineering**
Occupation	**Engineer**
Job Role	**Principal Engineer (Technology)**
Job Role Description	The Principal Engineer (Technology) applies his/her expertise in process technology to drive innovative solutions for complex engineering problems and plant improvement. He/She provides technical advice to support the long-term planning of production sites and facilities and to ensure the successful completion of engineering projects. The Principal Engineer (Technology) supports plant equipment automation and optimisation by recommending new process technologies and applications that enhance the efficiency of production and maintenance activities. He drives the development of the Process Safety Management (PSM) framework, ensures its integration into production processes and projects, and reviews the organisation's Major Hazard Installation (MHI) Safety Case. At the organisational level, he is responsible for translating continuous improvement strategies into actionable plans for the production and process engineering department, and for driving the development of technical capabilities for engineering teams to ensure optimum engineering support for plant facilities. The Principal Engineer (Technology) is a key resource person who advises senior management, plant customers and engineering groups, both internal and external, on process technology 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 thinking and decision-making skills.

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
		Review process safety incident findings and trends and recommend improvements
	Administer Process Safety Management (PSM) systems	Drive PSM framework development and integration into production processes and projects
		Provide technical expertise on plant safeguarding systems
		Review the organisation's Major Hazard Installation (MHI) Safety Case
	Perform process engineering support	Provide technical expertise for production trial runs
	Manage process engineering projects	Drive innovative solutions for complex engineering problems and plant improvement using emerging or new technologies
		Guide Safe System of Work (SSoW) processes and procedures for all engineering and technology improvement projects
		Provide technical advice to support long-term plans for production sites and facilities
	Manage equipment automation and optimisation	Act as the liaison between internal and/or external engineering groups and plant customers to ensure engineering input quality
		Recommend new process technologies and applications
		Recommend technologies and techniques that enhance the efficiency and effectiveness of production and maintenance activities
	Manage asset integrity	Formulate strategies and action plans to drive process integrity management and to recommend improvements
	Administer staff and organisational development	Build in-house technical capabilities for engineering teams
		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)**	
	Business Continuity Management	Level 5	Leadership	Advanced
	Business Networking Management	Level 5	Global Mindset	Advanced
	Change Management	Level 5	Transdisciplinary Thinking	Advanced
	Commissioning and Start-Up Management	Level 5	Developing People	Advanced
	Continuing Professional Development Management	Level 5	Decision Making	Advanced
	Continuous Improvement Management	Level 6		
	Data Analytics System Design	Level 4		
	Data and Statistical Analytics	Level 5		
	Engineering Management of Change	Level 5		
	Engineering Project Management	Level 5		
	Engineering Safety Standards Interpretation	Level 5		
	Engineering Support Management	Level 5		
	Environmental Management System Framework Development and Implementation	Level 4		
	Front-End Engineering Design Management	Level 5		
	Internet of Things Management	Level 5		

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Skills & Competencies	Major Hazard Installation Safety Case Management	Level 6	
	Operations Reporting Protocol Application	Level 5	
	Plant Economic Modelling	Level 5	
	Process Control	Level 5	
	Process Development Management	Level 6	
	Process Engineering Design	Level 6	
	Process Operations Troubleshooting	Level 5	
	Process Optimisation	Level 6	
	Process Plant and Equipment Integrity Management	Level 6	
	Process Safety Management Framework Development and Implementation	Level 5	
	Project Management	Level 6	
	Robotic and Automation Technology Application	Level 5	
	Safety Integrity Levels Management	Level 5	
	Standard Operating Procedure Development and Implementation	Level 6	
	Technical Presentation	Level 6	
	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.

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