

POWER ENGINEERING COMPETENCY FRAMEWORK

SKILLS MAP - Senior Principal Engineer / Principal Engineer (Design)

Sector	Power Engineering in the Public Service			
Track	Design			
Occupation	Electrical Engineer			
Job Role	Senior Principal Engineer / Principal Engineer (Design)			
Job Role Description	<p>The Senior Principal Engineer / Principal Engineer (Design) is responsible for planning the scope of work and electrical and power requirements, and reviewing engineering standards and technical specifications for electrical designs. He/She leads site surveys, investigations, feasibility reviews and simulations, and provides technical advice to optimise conceptual and detailed designs. He refines design plans to ensure mitigation of design risks during design and planning phase. He leads technical, constructability, maintainability and safety reviews for electrical designs, and advises stakeholders on the resolution of design and engineering gaps.</p> <p>He manages relationships with internal and external stakeholders, including evaluating contractor performance and compliance. He leads Design for Safety (DFS) review meetings with stakeholders, and reviews the agency's environmental sustainability practices. In addition, he leads innovation and green initiatives to drive decarbonisation, decentralisation and digitalisation. He should be authorised as a trained person by a licensed electrical worker to carry out the job duties or be a Professional Engineer or Licensed Electrical Worker.</p> <p>He is decisive and an experienced expert in providing technical guidance to a team of engineers. He also represents the agency and contributes to national energy and power policies, strategies and frameworks to balance economic competitiveness, environmental sustainability, energy security.</p>			
Critical Work Functions and Key Tasks / Performance Expectations	Critical Work Functions	Key Tasks	Performance Expectations (For legislated / regulated occupations)*	
			In accordance with:	
			- Electricity Act including subsidiary legislations	
			- Energy Market Authority of Singapore Act	
			- International Electrotechnical Commission (IEC) Standards	
			- International Organization for Standardisation (ISO) Standards	
			- Singapore Standards for Electrical and Power sector	
	- Workplace Safety and Health (WSH) Act			
				* Performance Expectations are non-exhaustive and subject to prevailing regulations and industry standards
	Design electrical equipment, systems and networks	Plan scope of work and electrical and power requirements		
		Review engineering standards for electrical designs		
		Lead site surveys, investigations, feasibility reviews and simulations prior to conceptual design		
		Optimise conceptual design of electrical equipment, systems and networks to enhance efficiency		
		Resolve technical and design issues to guide detailed design including schematics, technical specifications, test plans, and material requisition		
		Provide technical advice to improve the design and planning for electrical systems development		
		Refine design plans to ensure mitigation of design risks during design and planning phase		
	Conduct design reviews for electrical equipment, systems and networks	Lead reviews of conceptual and detailed design for electrical equipment, systems and networks		
		Recommend improvements to electrical designs to meet agency standards, objectives and requirements		
		Prescribe applicability of relevant industry regulations, codes of practice and safety standards for electrical designs		
		Lead constructability, maintainability and safety reviews for electrical designs		
		Advise stakeholders on resolution of design and engineering gaps to improve quality and efficiency of electrical equipment, systems and networks		
	Manage key stakeholders / Manage contractors	Represent the agency in inter-agency committees for technical matters, technology discussions and policy decisions		
		Manage relationships with internal and external stakeholders		
		Review tender briefs and technical specifications for electrical and power design services		
		Lead technical evaluation of tender submissions for electrical and power design services		
Review electrical and power design works done by contractors				
Evaluate contractor performance and compliance with technical standards and codes of practice				
Manage health, safety and environment	Lead Design for Safety (DFS) review meetings with stakeholders			
	Implement safe work practices for contractors to ensure compliance with statutory requirements and procedures			
	Ensure workplace adherence to relevant sector regulations and codes of practice			
	Review the agency's environmental sustainability practices, policies and procedures			
Contribute to decarbonisation, decentralisation and digitalisation initiatives	Contribute to national energy and power policies, strategies and frameworks to balance economic competitiveness, environmental sustainability, energy security			
	Lead innovation initiatives to leverage new electrical and power technologies			
	Review feasibility studies and assessments of new electrical and power technologies			
	Lead implementation of green initiatives for application of clean and renewable energy			
	Devise strategies for implementation of distributed power technologies			

Leverage data analytics to enhance operational and strategic decision-making

Skills & Competencies	Technical Skills and Competencies		Critical Core Skills	
	Airfield Lighting Systems Management	Level 4	Decision Making	Intermediate
Battery Systems Management	Level 4	Creative Thinking	Advanced	
Business Intelligence and Data Analytics	Level 4	Problem Solving	Advanced	
Continuous Improvement Management	Level 5	Collaboration	Advanced	
Contract and Contractor Management	Level 4	Transdisciplinary Thinking	Intermediate	
Cybersecurity Framework Application	Level 4	Sense-Making	Advanced	
Distributed Energy Resources Implementation and Interconnection	Level 5	Communication	Advanced	
Electric Vehicle Charging Systems Management	Level 5	Developing People	Intermediate	
Electrical Equipment and Systems Testing	Level 4	Customer Orientation	Advanced	
Electrical Systems Design	Level 4	Building Diversity	Intermediate	
Electricity Network Planning	Level 4	Digital Fluency	Advanced	
Emergency Response and Crisis Management	Level 5	Learning Agility	Intermediate	
Energy Storage Systems Management	Level 5	Adaptability	Intermediate	
Engineering Asset Management	Level 4	Influence	Intermediate	
Engineering Problem Solving	Level 5	Self Management	Intermediate	
Engineering Safety Standards Interpretation	Level 4			
Environmental Sustainability Management	Level 5			
Fuel Cells Technologies Application	Level 5			
Hybrid AC and DC Power Distribution and Utilisation	Level 5			
Innovation Management	Level 5			
Inter-agency Collaboration	Level 5			
Internet of Things (IoT) Application	Level 5			
Lifts and Escalators Systems Management	Level 4			
Lighting Technologies Application	Level 5			
Lightning Protection Systems Management	Level 4			
Microgrids Implementation	Level 5			
Modelling, Simulation and Visualisation	Level 4			
Policy Development	Level 3			
Power Engineering Management	Level 5			
Predictive Maintenance Management	Level 4			
Public Health and Safety Management	Level 5			
Regulatory Compliance and Risk Management	Level 5			
Relay and Protection Systems Management	Level 4			
Reliability Centred Maintenance Management	Level 4			
Renewable Energy Technologies Application	Level 5			
Robotics and Automation Systems Application	Level 4			
Smart Grid Implementation	Level 5			
Solar Photovoltaic Systems Application	Level 5			
Solid-State Power System Apparatus Implementation	Level 5			
Stakeholder Management	Level 5			
Strategy Development	Level 5			

	Substation Automation Systems Management	Level 5	
	Substation Design Management	Level 4	
	Technology Road Mapping	Level 5	
	Traction Power Systems Management	Level 5	
	Uninterrupted Power Supply Management	Level 4	
Programme Listing	For a list of training programmes available for the Power Engineers in the Public Service, please refer to separate document on training courses.		

The information contained in this document serves as a guide.