

**POWER ENGINEERING COMPETENCY FRAMEWORK FOR POWER ENGINEERING PROFESSIONALS IN PUBLIC SERVICE
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Decentralisation					
TSC Title	Microgrids Implementation					
TSC Description	Manage deployment of microgrids suitable for interfacing with the power grid through sensing and communication technology					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
				<Insert TSC Code>	<Insert TSC Code>	<Insert TSC Code>
				Apply knowledge of power engineering in tender specification and project management for implementation of microgrids	Review the quality, performance and interoperability of microgrids	Develop plans to establish new or upgrade existing power networks to microgrids
Knowledge				<ul style="list-style-type: none"> • Components of microgrids • Solar panels and photovoltaics (PV) in microgrids • Assembling a microgrid and tools for implementation • Microgrid performance • Benefits and challenges of microgrids • Energy management systems (EMS) in microgrids • Challenges related to microgrid EMS Requirements and safety standards for microgrids implementation 	<ul style="list-style-type: none"> • Benefits and challenges of microgrids • Microgrids interconnections • Stability assessment of microgrids • Peak shaving, load shedding, energy shifting and PV smoothing in microgrids • Energy management systems (EMS) in microgrids and its application in different scales • Feasibility, planning and risks for microgrids project • Future developments in microgrids • Emerging needs for energy storages • Market policies, industry standards and rules related to future development of microgrids in Singapore and other regions 	<ul style="list-style-type: none"> • Trends for microgrids • Microgrids interconnections • Stability assessment of microgrids • Future developments in microgrids and its EMS • Market policies, industry standards and rules related to future development of microgrids in Singapore and other regions

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<p>Abilities</p>				<ul style="list-style-type: none"> • Explain the value proposition of microgrids and its barriers • Describe the operation and control of microgrids from basic traditional approaches to the advanced hierarchical control of microgrids • Articulate the advantages and disadvantages of microgrid EMs • Supervise microgrids implementation projects • Witness testing and measurement to verify performance and compliance with regulatory requirements, industry standards and tender specifications • Oversee performance of microgrids • Prepare progress reports on microgrids installation and site acceptance tests 	<ul style="list-style-type: none"> • Review designs of an efficient microgrid system to optimise operations • Provide technical advice on microgrids interconnection with existing power networks • Develop solutions for challenges related to microgrid EMS • Review progress reports for compliance with regulatory requirements, industry standards and tender specifications • Interpret market policies, standards and rules related to the future development of microgrids in Singapore and other regions 	<ul style="list-style-type: none"> • Lead discussions to share trends and the future of microgrids within their organisation • Assess the feasibility of microgrids in existing power networks • Evaluate feasibility EMS technologies in microgrids • Drive the development and deployment of microgrids based on market policies, standards and rules related to the future development of microgrids in Singapore and other regions
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