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

TSC Category	Power Systems Monitoring and Control					
TSC Title	Power System Monitoring and Control Management					
TSC Description	Monitor and control the power generation, distribution and transmission systems to maintain power system security					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
			<Insert TSC Code>	**<Insert TSC Code>**	**<Insert TSC Code>**	**<Insert TSC Code>**
			Perform real-time monitoring and control of the power system, and carry out remote switching operations on transmission equipment	Identify system abnormalities and disturbances that arise in the power system and suggest corrective actions	Recommend solutions for system abnormalities and disturbances that arise in the power system	Formulate power system monitoring and control strategies and plans to ensure secure and reliable supply of electricity
Knowledge			• Components and features of System Control Centre (SCC) • Principles of operating SCC • Principles of operating the power system • Types of abnormalities and control requirements • Types of control systems and process control algorithms • Methods of monitoring and controlling the power system • Methods of mitigating process abnormalities • Hazard identification and safety implications of actions • Reporting procedures on the performance of process control systems • Techniques for the modification of process control algorithm and models	• Regulatory requirements and organisational objectives • Principles of operating parameters and operating procedures • Principles of transmission and distribution process control and control modes • Methods of monitoring and controlling the power system • Methods of investigating process abnormalities	• Application of regulatory requirements and organisational objectives • Principles of supervising control operation of operator stations keyboards, alarm and equipment status panels, emergency shutdown push buttons and various control modes and status of control system • Interrelationships between multiple units • Techniques for monitoring and controlling the interlinkages across various units	• Application and interpretation of regulatory requirements and organisational objectives • Principles of supervising control operation including operator stations keyboards, alarm and equipment status panels, emergency shutdown push buttons and various control modes and status of control system • Interrelationships between multiple units • Techniques for monitoring and controlling the interlinkages across various units • Industry best practices related to process operations and Standard Operating Procedures (SOPs) for operational tasks
Abilities			• Monitor and operate transmission equipment and distribution network and associated facilities of power systems on Supervisory Control and	• Perform analysis and determine control requirements for power system • Set up process control and tune the process	• Lead in the review and update of the operating procedures for System Control Centre (SCC) operations	• Establish transmission network key performance indicators and formulate strategies to achieve them

			Data Acquisition (SCADA) system • Monitor the operations of the SCC and power system in accordance to standards and procedures • Liaise with internal and external parties in normal and contingency events • Analyse investigation reports and take appropriate measures to rectify the abnormalities • Conduct root cause analysis • Maintain process control for transmission equipment and distribution system • Perform tuning for the process control algorithm and/or models to meet production requirements • Monitor and report the performance of process control systems	control algorithms and models to meet production requirements • Analyse and correlate multiple process variables to suggest improvements on process control systems • Review operating procedures for System Control Centre (SCC) operations and propose improvement areas • Suggest solutions to resolve network abnormalities at a transmission level • Analyse historical and day-to-day transmission operation data to propose transmission network operation enhancements	• Provide technical guidance to solve abnormalities and deviations from operation plans • Develop standards, guidelines and protocols on monitoring and managing the power system • Integrate enhancements to network transmission processes and work activities • Identify gaps in policies, regulation and design of network transmission and propose amendments to meet future development requirements • Ensure training plans are in place and implemented	• Establish monitoring strategies for better control over processes • Formulate measures to manage abnormalities • Translate industry best practices into SOPs development and implementation • Ensure all safety requirements are up to date and correctly implemented
Range of Application		Range of application includes, but is not limited to: • Systems used in monitoring and control of the power system, including but not limited to: energy management systems, information technology (IT) and operational technology (OT) systems, substation remote control unit (RCU) systems, flexible AC transmission systems (FACTS), and supervisory control and data acquisition (SCADA) systems				