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

TSC Category	Electrical and Power Systems Management					
TSC Title	Relay and Protection Systems Management					
TSC Description	Develop technical proposals and schematics of relay and protection systems for new substation projects					
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>**	
		Verify design and oversee the installation and testing of relay and protection systems	Review design, testing and commissioning of relay and protection systems to ensure adherence to technical specifications	Provide solutions to optimise relay and protection systems to enhance safety, reliability, compliance and maintainability	Evaluate and approve relay and protection system proposals and identify opportunities to adopt new technologies	
Knowledge		• Components of electricity transmission and distribution relay and protection systems • Characteristics and potential dangers of relay and protection system components • Concepts of layouts, designs and drawings of substations and circuits • Concepts of settings, schematics and specifications of relay and protection systems • Computer-aided drawing techniques • Relay and protection systems installation and testing techniques • Relevant regulations, industry standards, codes of practice, and safety procedures	• Operating principles of transmission and distribution feeder protection systems • Components and operating principles of protection relays • Concepts of settings, schematics and specifications of protection systems • Technical proposal and schematics review methods • Relay and protection systems design and modification methods • Relay and protection systems installation, testing and commissioning processes • Relevant regulations, industry standards, codes of practice, and safety procedures	• Components and operating principles of transmission and distribution protection systems • Components and operating principles of complex protection relays • Complex protection settings, schematics and specifications • Rules for control and safe operation of low and high voltage apparatus • Evaluation techniques of technical proposals and schematics of protection systems for new substations or circuits • Energy efficiency optimisation techniques • Relay and protection systems design, installation, testing and commissioning standards • Relevant regulations, industry standards, codes of practice, and safety procedures	• Components and operating principles of transmission and distribution protection systems • Rules for control and safe operation of low and high voltage • Settings, schematics and specifications of large-scale protection systems involving new substations and new circuits • Industry developments, trends and best practices in network protection schemes • Local and international electrical safety best practices, and standards • Relay and protection systems design, installation, testing and commissioning standards • Relevant regulations, industry standards, codes of practice, and safety procedures	
Abilities		• Verify drawings and specifications of substations and their equipment • Check schematics and drawings of relay and protection systems	• Review schematics and drawings of main and backup protection systems • Review technical specifications of main and	• Evaluate proposals and schematics of transmission and distribution complex relay and protection systems • Evaluate technical proposals and	• Approve proposals and schematics of transmission and distribution protection systems for new substations or new circuits	

		• Oversee computer-aided drawing designs • Oversee installation and testing of relay and protection systems • Verify adherence to technical specifications and project requirements • Check compliance with regulations, industry standards, and codes of practice	backup protection systems • Review proposals and schematics of simple relay and protection systems • Review installation, testing and commissioning of relay and protection systems • Review compliance with regulations, industry standards, and codes of practice	schematics of simple protection systems for new substations or circuits based on network operational requirements • Optimise protection philosophies, policies and procedures to reflect latest industry developments, trends and best practices • Validate installation, testing and commissioning against project requirements and industry standards • Ensure compliance with regulations, industry standards, and codes of practice	• Provide acceptance for design, installation and commissioning of relay and protection systems • Approve protection philosophies, policies and procedures • Promote industry best practices in relay and protection systems • Recommend solutions to adopt new technologies for relay and protection systems • Drive compliance with regulations, industry standards, and codes of practice	

Range of Application		Range of application includes, but is not limited to:
		• Current transformer and/or voltage transformer (CT/VT) circuits
		• Trip circuits
		• Protection relays used in substations
		  ○ Distance protection
		  ○ Differential protection
		  ○ Busbar protection,
		  ○ Main and backup protection				