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

TSC Category	Energy Operations Management					
TSC Title	Power Plant Inspection					
TSC Description	Conduct routine and ad hoc inspections to identify any power plant equipment and system issues and potential hazards					
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>**	
		Assist in routine and ad hoc power plant inspections based on standard operating procedures and parameters	Conduct routine and ad hoc power plant inspections independently based on standard operating procedures and parameters	Review power plant inspection reports to identify any potential equipment issues and hazards which require further verification or attention	Lead power plant inspection teams and deploy inspection best practices to pre-empt potential equipment issues and hazards	
Knowledge		• Fundamental understanding of the relevant sections of the Electricity Act and regulatory requirements • Operating principles and normal functionalities of power plants, equipment and systems • Methods for identifying early warning signs of potential problems with power plants, equipment and systems • Pipelines and piping inspection methods • Welding technology, techniques, codes, and standards • Concepts on non-destructive testing (NDT) methods, comprising visual testing (VT), ultrasonic testing (UT), magnetic particles testing (MT), dye penetrant testing (PT), and radiographic testing (RT) • Methods of reading engineering diagrams • Principles of quality and inspection plans	• Fundamental understanding of the relevant sections of the Electricity Act and regulatory requirements • Operating principles and normal functionalities of power plants, equipment and systems • Pipelines and piping inspection methods • Welding technology, techniques, codes, and standards • Principles of cathodic protection • Passive and depassivation behaviour • Non-destructive testing (NDT) methods, comprising visual testing (VT), ultrasonic testing (UT), magnetic particles testing (MT), dye penetrant testing (PT), and radiographic testing (RT) • Principles and techniques of conducting condition monitoring	• Interpretation of relevant sections of the Electricity Act and regulatory requirements • Quality management for operations, modifications, repairs and abandonment • Pipelines and piping inspection methods • Welding technologies • Principles of cathodic protection • Fired and unfired pressure vessels inspection methods, techniques, codes, and standards • Failure investigation and prevention methods • Corrosion engineering • Types of risk-based assessments using Risk Based Inspection standards • Passive and depassivation behaviour in corrosion-prone equipment • Vendors' equipment maintenance and inspection requirements	• Interpretation and application of relevant sections of the Electricity Act and regulatory requirements • Corrosion monitoring and control methods • High temperature material performance and degradation principles • Welding and jointing technology • Non-destructive testing (NDT) comprising ultrasonic, magnetic flux, thermography, ionising radiation, phased array ultrasonic testing (UT), time of flight (ToF) • Principles and methods of risk-based inspection • Equipment inspection and examination techniques • Automated and/or robotic inspection technologies • Power plant and equipment inspection benchmarking strategies	

Abilities		• Perform basic routine and ad hoc power plant inspections under supervision, based on SOPs and parameters • Conduct pipeline and piping inspections and recommend NDT applications • Prepare inspection reports with observations and findings	• Perform basic routine and ad hoc power plant inspections under supervision, based on SOPs and parameters • Conduct pipeline and piping inspections and recommend NDT applications • Prepare inspection reports with observations and findings • Perform inspections of cathodic protection systems • Evaluate and interpret NDT results in line with relevant codes, standards and specifications	• Apply quality control methods for operation, modification, repair and abandonment of fixed equipment and piping • Perform structured failure investigations to identify failure modes and/or mechanisms • Review pipeline and piping inspections and recommend NDT applications • Review inspection reports and decide whether further verifications and/or attentions are required • Supervise inspections of cathodic protection systems • Evaluate, select and specify NDT methods and techniques for inspections • Evaluate and interpret NDT results in line with relevant codes, standards and specifications • Review condition monitoring reports	• Analyse material application standards and codes in the review process • Evaluate results and draw conclusions from failure investigations • Prepare corrosion management strategies recommendation through information gathered from corrosion monitoring tools • Review inspection and condition monitoring results and recommend high temperature material degradation controls, material selection and coatings • Analyse inspection and NDT results and make recommendations on the influence of welding heat input in relation to metallurgical changes, either physical or chemical • Advise on corrosion resistance properties and behaviours of base materials, overlay and welds based on inspection and condition monitoring results • Review and approve NDT results • Lead the development of the organisation's power plant inspection standards and strategies	