

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

TSC Category	Maintenance Management					
TSC Title	Predictive Maintenance Management					
TSC Description	Manage predictive maintenance strategies and plans to optimise electrical equipment, system and network availability and reliability					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			<Insert TSC Code>	<Insert TSC Code>	<Insert TSC Code>	
			Analyse condition monitoring results and performance data to identify trends and oversee the development of predictive maintenance plans	Review predictive maintenance plans to anticipate, detect and prevent potential electrical failures based on real-time data insights	Formulate or approve predictive maintenance strategies according to industry best practices and emerging technologies for optimal electrical infrastructure availability and reliability	
Knowledge			<ul style="list-style-type: none"> • Condition-based monitoring systems, applications and uses • Engineering concepts and principles of system monitoring and predictive maintenance • Statistics and analytics techniques • Data visualisation tools and techniques • Predictive models and assessment • Predictive modelling techniques • Principles of text mining and data mining • Data mining and preparation tools and techniques 	<ul style="list-style-type: none"> • Predictive maintenance systems • Predictive maintenance process models • Predictive maintenance methods through technology applications • Types of data and analysis used in predictive maintenance and performance monitoring • Statistical concepts and distributions • Statistical process monitoring of measurements • Correlation and regression analysis of data • Failure time modelling 	<ul style="list-style-type: none"> • Predictive analytics applications • Approaches for developing and planning predictive maintenance strategies • Local and international industry best practices • Data science techniques and applications • Big data technologies and tools • Application of internet of things • Range of artificial intelligence applications • Machine learning approaches for failure type detection and predictive maintenance • Organisational strategies and direction in asset management 	
Abilities			<ul style="list-style-type: none"> • Analyse condition monitoring and inspection data, records and feedback 	<ul style="list-style-type: none"> • Review condition monitoring analysis and interpret failure history to predict required maintenance type and timing for different 	<ul style="list-style-type: none"> • Approve condition monitoring and inspection reports • Formulate or approve predictive maintenance strategies 	

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			<ul style="list-style-type: none"> • Oversee data preparation, exploration and visualisation • Analyse data collected using predictive algorithms to detect patterns and generate insights • Identify condition indicators and oversee the development of prediction models • Propose predictive maintenance procedures to existing monitoring regime 	<p>electrical equipment, systems and networks</p> <ul style="list-style-type: none"> • Review predictive maintenance plans for monitoring the condition and performance of equipment and reduce likelihood of failures • Assess impact of predictive maintenance plans on operations • Review analyses and findings on trends, issues and historical failures • Determine performance data indicators that must be monitored • Evaluate risk factors that could affect the predictive maintenance plans • Establish resource requirements and manpower capabilities to operationalise predictive maintenance regimes 	<ul style="list-style-type: none"> • Synergise corrective, preventive and predictive maintenance plans and strategies to deliver seamless asset management solutions • Align predictive maintenance plans with maintenance and overall organisational strategies • Keep abreast of new technological developments in maintenance strategies and systems • Influence the adaptation and adoption of relevant current and emerging technologies, systems and processes in predictive maintenance regimes 	
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