

TSC Category	Maintenance Management					
TSC	Preventive Maintenance Management					
TSC Description	Develop and implement preventive maintenance workflows, procedures and practices to optimise plant equipment availability and reliability					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	ECM-MAI-1005-1.1	ECM-MAI-2005-1.1	ECM-MAI-3005-1.1	ECM-MAI-4005-1.1	ECM-MAI-5005-1.1	ECM-MAI-6005-1.1
	Identify appropriate maintenance procedures and practices to assist in maintenance tasks for process equipment and systems in a safe and reliable manner	Select and apply appropriate maintenance procedures and practices to carry out maintenance tasks for process equipment and systems in a safe and reliable manner	Interpret and maintain preventive maintenance workflows, procedures and practices to coordinate the execution of maintenance tasks in a safe and reliable manner	Develop technical preventive maintenance workflows and procedures to reduce likelihood of failure and to ensure maintenance tasks are performed correctly and consistently	Evaluate maintenance workflows, procedures and practices to manage maintenance tasks in accordance with regulatory requirements and organisational objectives	Drive maintenance strategies with reference to industry best practices and emerging technologies to achieve optimal plant and equipment availability and reliability
Knowledge	<ul style="list-style-type: none"> Maintenance and reliability principles Fundamentals of maintenance regimes and plans Types of maintenance work instructions Safe maintenance work procedures Vendors' maintenance procedures Types of documents for monitoring and recording maintenance work 	<ul style="list-style-type: none"> Fundamentals and types of corrective, preventive and predictive maintenance work Maintenance procedures for process equipment and systems Operating principles and normal functionalities of equipment Methods of identifying early warning signs of potential problems with equipment Equipment troubleshooting principles and practices Maintenance data analysis and trending interpretation Types of maintenance tools and equipment and their functions Health, Safety and Environment (HSE) 	<ul style="list-style-type: none"> Fundamental principles of maintenance management Principles of Overall Equipment Effectiveness (OEE) Equipment failure investigations Failure and Root Cause Analysis (RCA) methods Inventory control and management techniques Health, Safety and Environment (HSE) practices such as risk assessments, Job Safety Analysis (JSA) related to maintenance work Predictive maintenance methods 	<ul style="list-style-type: none"> Fundamental principles of maintenance management and asset integrity Methods of determining Overall Equipment Effectiveness (OEE) Principles of condition monitoring analysis and techniques to analyse condition monitoring data Methods to develop calibration and maintenance plans Techniques to determine mean time between failure (MTBF) Data and statistical information analysis Plant inspection principles and techniques Predictive maintenance methods through technology applications 	<ul style="list-style-type: none"> Fundamental principles of maintenance management and asset integrity Principles of mechanical, hydraulic and electrical systems, and their calibration Requirements of proactive maintenance strategies and their implementation Vendors' equipment maintenance and inspection requirements Equipment maintenance optimisation techniques Business value, costs and implications of preventive maintenance activities Methods of calculating return on investment Predictive maintenance and automation 	<ul style="list-style-type: none"> Organisational strategies Key manufacturing priorities and objectives Strategic thinking and its application to corrective and preventive maintenance Methods of formulating maintenance strategies Maintenance performance indicators Strengths and limitations of strategies, techniques and tools used in maintenance planning Methods of assessing return on investment on the cost of maintenance Equipment reliability strategies New and emerging technologies in asset integrity, predictive maintenance and automation

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		<p>practices related to maintenance procedures</p> <ul style="list-style-type: none"> • Maintenance recording procedures • Condition-based monitoring systems, applications and uses • Applications of computer-based maintenance management systems 		<ul style="list-style-type: none"> • Automated inspection methods 	technologies	<ul style="list-style-type: none"> • International standards and best practices in maintenance
Abilities	<ul style="list-style-type: none"> • Identify appropriate maintenance procedures and practices • Assist in plant corrective and preventative maintenance tasks for process equipment and systems • Assist in routine monitoring and inspection for process equipment and systems • Assist in the troubleshooting and rectification of process equipment and systems • Identify and locate applicable vendors' maintenance procedures • Apply safe maintenance work procedures • Follow maintenance work instructions • Select and use tools and equipment for maintenance inspections and repairs • Record routine maintenance work 	<ul style="list-style-type: none"> • Select and apply appropriate maintenance procedures and practices • Perform routine monitoring and inspection of process equipment and systems • Perform corrective and preventative maintenance on process equipment and systems • Perform process equipment and system troubleshooting and rectification • Apply maintenance work instructions and safe work procedures • Select and use tools and equipment for maintenance inspections and repairs • Conduct risk assessments and adhere to relevant HSE risk control measures when performing maintenance work • Record and log maintenance and inspection activities including shift handover reports in the 	<ul style="list-style-type: none"> • Interpret preventive maintenance workflows, procedures and practices • Coordinate routine monitoring and inspection of process equipment and systems • Coordinate and prioritise plant preventative and corrective maintenance activities • Review maintenance and inspection data, records and feedback • Coordinate process equipment and system troubleshooting and rectification • Coordinate recording and input of maintenance and inspection work in the Computerised Maintenance Management System (CMMS) • Analyse maintenance logs and documentation to identify trends and common issues • Spares and inventory management for maintenance work 	<ul style="list-style-type: none"> • Analyse process equipment and system performance • Undertake condition monitoring analysis to predict required maintenance type and timing for different equipment and systems • Interpret failure history, carry out analysis and apply corrective actions • Develop maintenance workflows and procedures detailing key maintenance activities and their priorities • Estimate resources needed to implement preventive maintenance plans • Review logs of all repair works pending and conducted, and maintain records of the solutions applied to each case • Analyse mean time between failures (MTBF) from maintenance and other maintenance performance criteria • Develop solutions to minimise or eliminate machine or system 	<ul style="list-style-type: none"> • Manage maintenance teams • Establish key performance indicators (KPIs) and targets for maintenance programmes and regimes • Evaluate maintenance programmes, workflows and practices • Provide expert technical guidance on new or complex engineering and maintenance activities and processes • Evaluate tangible and intangible benefits of enhancements to preventive maintenance processes • Develop plans for root cause analyses and reliability studies • Review effectiveness and return on investment of preventive maintenance activities • Recommend changes and continuous improvement measures to enhance preventive maintenance processes and effectiveness 	<ul style="list-style-type: none"> • Liaise with key stakeholders to determine objectives of the maintenance strategy • Compare possible strategies, techniques and tools to select the preferred maintenance strategy to improve reliability of equipment • Provide technical justification for resource requirements to support maintenance strategy to senior management • Establish key performance indicators (KPIs) for maintenance teams • Evaluate performance indicators against desired levels to identify areas requiring adjustment • Manage impact of spare inventory levels on the business • Oversee integration of maintenance sub-functions and activities to add value to the manufacturing site

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		<p>Computerised Maintenance Management System (CMMS)</p>	<ul style="list-style-type: none"> Carry out work area inspections and HSE related tasks such as risk assessments and JSA for maintenance work Provide input for maintenance inspection reports 	<p>malfunctions and improve deterioration rates</p> <ul style="list-style-type: none"> Outline standard quality and safe procedures to adhere to during maintenance work Issue maintenance work instructions Prepare maintenance and inspection reports for management 	<ul style="list-style-type: none"> Develop maintenance reports and expenditure updates Liaise with equipment vendors and build effective business relationships Work cross-functionally with key business stakeholders to maximise plant uptime and availability Manage feasibility studies and the implementation of predictive maintenance and automation technologies 	<ul style="list-style-type: none"> Deliver regular reports on engineering and maintenance activities to senior management and leadership teams Drive the application of new and emerging technology in asset integrity, predictive maintenance and automation
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