### TSC Category
Maintenance Management

### TSC
Condition-based Assets Monitoring Management

### TSC Description
Formulate and implement condition-based maintenance procedures to enhance organisation maintenance regimes and operational reliability

<table>
<thead>
<tr>
<th>TSC Proficiency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
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</thead>
<tbody>
<tr>
<td>TSC Description</td>
<td>PTP-MAI-1025-1.1</td>
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<tr>
<td>Carry out routine inspections using condition-based monitoring methods on systems, equipment and components</td>
<td>Support the implementation of condition-based monitoring procedures</td>
<td>Implement condition-based monitoring procedures to determine conditions and identify variances in systems, equipment and components</td>
<td>Develop condition-based monitoring regime to analyse, diagnose and mitigate systematic deterioration of systems, equipment and components</td>
<td>Review current and historical performance of systems, equipment and components to determine requirements of condition-based monitoring regime</td>
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### Knowledge
- Types and signs of observable wear and tears, stress signatures, and fault indicators
- Types of sampling and measurement methods and techniques
- Tolerance limits of components and systems
- Tools, gauges, and instruments for measurement
- Organisational and/or original equipment manufacturer (OEM) guidelines, schedules and intervals for measurement sampling
- Organisational standards for documentation and reporting procedures
- Methods to obtain process parameters sampling data
- Types and functionalities of monitoring instruments, equipment and sensors
- Procedure to set up and configure monitoring equipment, instrument and sensors
- Equipment calibration methods
- Organisational procedures and/or original equipment manufacturer (OEM) guidelines, schedules and intervals for condition-based monitoring
- Organisational standards for documentation and reporting procedures
- Methods to obtain process parameters sampling data
- Types, functionalities and applications of different types of monitoring instruments, equipment and sensors
- Procedure to set up and configure monitoring equipment
- Types and causes of sampling data errors and rectification methods
- Organisational condition-based monitoring procedures
- Types of abnormal performance and signs of faulty operational systems, equipment and components
- Tolerance limits and critical failure indexes of systems, equipment and components
- Instrumentation and control methods
- Root cause analysis methods and processes
- Organisational condition-based monitoring procedures and implementation schedules
- Organisational standard operating procedures (SOPs) on monitoring operations and regime
- Engineering concepts and principles
- Condition-based monitoring concepts and principles
- Asset life-cycle management plans
- Requirements of data acquisition system relevant to condition-based monitoring applications
- Commercially viable diagnostic techniques, tools and equipment
- Variable operational and/or environmental factors and limitations of data generated from condition-based monitoring techniques
- Types of training programmes and certification requirements for maintenance personnel
- Organisational and original equipment manufacturer (OEM) quality standards

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<table>
<thead>
<tr>
<th>Abilities</th>
<th>and implementation schedules</th>
<th>monitoring and predictive maintenance</th>
<th>Organisational maintenance regime and strategies</th>
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<tbody>
<tr>
<td>• Carry out visual inspection of systems, equipment and components</td>
<td>• Prepare systems, equipment and components for condition-based monitoring implementation at pre-determined schedules</td>
<td>• Define operating and condition safety limits of systems, equipment and components</td>
<td>• Conduct audit on implementation and operational plans for condition-based monitoring regimes</td>
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<tr>
<td>• Carry out scheduled sampling and measurement of systems, equipment and components at pre-determined intervals</td>
<td>• Assist to set up condition-based monitoring equipment and/or mount sensors for continuous data collection</td>
<td>• Identify continuous monitoring methods or periodic monitoring cycles methods for condition-based monitoring applications</td>
<td>• Establish prioritisation of condition-based monitoring regime for assets based on cost benefits and asset life-cycle management plans</td>
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<td>• Adopt safe handling and operating procedure of tools and equipment</td>
<td>• Collect spot readings of data to identify potential errors due to equipment set-up and/or configuration errors</td>
<td>• Set effective quantitative and qualitative process parameters</td>
<td>• Audit parameters for systems, equipment and components operating and condition safety limits</td>
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<td>• Record observations, measurement and readings and highlight variances</td>
<td>• Assist with equipment calibration</td>
<td>• Develop condition-based monitoring regimes and implementation methodologies</td>
<td>• Establish resource requirements and manpower capabilities to operationalise condition-based monitoring regimes</td>
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<td>• Carry out established condition-based monitoring procedures during routine operations and/or maintenance of systems, equipment and components</td>
<td>• Analyse data collected from various condition-based monitoring sources</td>
<td>• Audit data sample ranges to verify systems, equipment and components conditions for mitigation requirements</td>
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<td>• Collate reports and record data samples collected and highlight variances</td>
<td>• Assess data against historic data, performance trends and systems, equipment and components specifications to verify data integrity</td>
<td>• Review organisational monitoring regimes to incorporate procedural enhancements</td>
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