### TSC Category
Engineering and Manufacturing Fundamentals

### TSC
Hydraulic Systems Management

### TSC Description
Design, repair and operate hydraulic systems within a manufacturing environment

<table>
<thead>
<tr>
<th>TSC Proficiency Description</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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<tbody>
<tr>
<td>PRE-EPM-1067-1.1</td>
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<tr>
<td>Operate hydraulic systems in a manufacturing environment</td>
<td>Perform maintenance and repair on hydraulic systems</td>
<td>Design and test hydraulic systems for manufacturing operations</td>
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### Knowledge

- Interpretation of control requirements, hydraulic symbols, circuit diagram symbols and displacement diagram
- Types of hydraulic components and electrical devices
- Procedures for checking, verifying and amending completed circuits
- Procedures for testing hydraulic equipment and systems
- Safe practices in operating hydraulic systems
- Maintenance and proper storage of components
- Shut-down of hydraulic equipment and systems
- Workplace safety and health (WSH) standards and regulations
- Task scopes, task boundaries and hydraulic equipment isolation requirements
- Test and support equipment requirements and support documentation
- Scheduling of tasks in enterprise maintenance management system
- Steps in conducting pre-maintenance tests on hydraulic systems
- Enterprise instructions for system shut-down, service isolation with the use of isolation tags, system services restoration, and isolation tag removal
- Hydraulic hygiene principles for the opening and closing up of system inspections, maintenance and/or repairs
- Procedures for depressurising or isolating system pressure vessels, recharging and de-isolating system pressure vessels, according to specified instructions
- Types and usage of hydraulic components, electrical devices and equipment
- Types of hardware and software for design drawing
- Types and usage of displacement diagrams
- ISO circuit diagrams and symbols related to hydraulic systems
- Pneumatic equipment and systems configurations and processes
- Design principles and procedures for hydraulic and/or electro-hydraulic circuits
- Operation of hydraulic and/or electro-hydraulic components and electrical devices
- Procedures for checking, verifying and amending completed pneumatic control circuits
- Workplace safety and health (WSH) standards and regulations
<table>
<thead>
<tr>
<th>Abilities</th>
<th>• Approved parts, support and test equipment for repairs and maintenance</th>
<th>• Approved procedures for operating and testing hydraulic systems</th>
<th>• Workplace safety and health (WSH) standards and regulations</th>
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<tr>
<td>• Identify test and support equipment and support documentation required for the tasks</td>
<td>• Identify control sequence for designing hydraulic equipment and systems based on control requirements and displacement diagrams</td>
<td>• Identify and select required hydraulic components and/or electrical devices based on given control requirements</td>
<td>• Perform quality and process checks of computerised hardware and software required for hydraulic equipment and systems design, in accordance with approved written work instructions</td>
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<td>• Identify and tag faulty and/or unsafe components</td>
<td>• Determine equipment maintenance shut-down periods and inform users of maintenance and/or repair schedules</td>
<td>• Conduct and record pre-maintenance tests as specified in system documentation</td>
<td>• Draft hydraulic equipment and system designs to fulfil control requirements, in accordance with ISO symbols</td>
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<td>• Maintain good housekeeping in accordance with WSH practices</td>
<td>• Verify the availability of test and support equipment and support documentation, in accordance with enterprise procedures</td>
<td>• Isolate and shut-down hydraulic systems for maintenance and/or repair</td>
<td>• Design hydraulic and electro-hydraulic circuits, in accordance with control requirements</td>
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<td>• Identify serviceable components and/or parts for proper recycling and replace spoilt components with good</td>
<td>• Test and modify hydraulic equipment and systems in accordance with organisational procedures to ensure design meets control requirements</td>
<td>• Depressurise or isolate system pressure vessels, in accordance with applicable instructions</td>
<td>• Check completed circuit diagrams, and make necessary amendments, to ensure control requirements are met</td>
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| Conditioned-used, recycled components | • Restore hydraulic system services, operate and test system performance after maintenance and/or repair, in accordance with approved procedures, and in conjunction with users and operators  
• Investigate defects and anomalous operations, and record causes to rectify all anomalies and defects  
• Compile relevant reports in accordance with approved procedures | • Prepare parts list of all components used in hydraulic equipment and systems  
• Connect hydraulic components, electrical devices and wiring, according to completed circuit diagrams  
• Activate and test hydraulic equipment and systems, in accordance with established organisational procedures, and make modifications to ensure that control requirements are met  
• Record testing results of hydraulic equipment and systems |