

**SKILLS FRAMEWORK FOR PRECISION ENGINEERING  
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

<b>TSC Category</b>	Engineering and Manufacturing Fundamentals					
<b>TSC</b>	Hydraulic Systems Management					
<b>TSC Description</b>	Design, repair and operate hydraulic systems within a manufacturing environment					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
	<b>PRE-EPM-1067-1.1</b>	<b>PRE-EPM-2067-1.1</b>	<b>PRE-EPM-3067-1.1</b>			
	Operate hydraulic systems in a manufacturing environment	Perform maintenance and repair on hydraulic systems	Design and test hydraulic systems for manufacturing operations			
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Interpretation of control requirements, hydraulic symbols, circuit diagram symbols and displacement diagram</li> <li>• Types of hydraulic components and electrical devices</li> <li>• Procedures for checking, verifying and amending completed circuits</li> <li>• Procedures for testing hydraulic equipment and systems</li> <li>• Safe practices in operating hydraulic systems</li> <li>• Maintenance and proper storage of components</li> <li>• Shut-down of hydraulic equipment and systems</li> <li>• Workplace safety and health (WSH) standards and regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Task scopes, task boundaries and hydraulic equipment isolation requirements</li> <li>• Test and support equipment requirements and support documentation</li> <li>• Scheduling of tasks in enterprise maintenance management system</li> <li>• Steps in conducting pre-maintenance tests on hydraulic systems</li> <li>• Enterprise instructions for system shut-down, service isolation with the use of isolation tags, system services restoration, and isolation tag removal</li> <li>• Hydraulic hygiene principles for the opening and closing up of system inspections, maintenance and/or repairs</li> <li>• Procedures for depressurising or isolating system pressure vessels, recharging and de-isolating system pressure vessels, according to specified instructions</li> </ul>	<ul style="list-style-type: none"> <li>• Types and usage of hydraulic components, electrical devices and equipment</li> <li>• Types of hardware and software for design drawing</li> <li>• Types and usage of displacement diagrams</li> <li>• ISO circuit diagrams and symbols related to hydraulic systems</li> <li>• Pneumatic equipment and systems configurations and processes</li> <li>• Design principles and procedures for hydraulic and/or electro-hydraulic circuits,</li> <li>• Operation of hydraulic and/or electro-hydraulic components and electrical devices</li> <li>• Procedures for checking, verifying and amending completed pneumatic control circuits</li> <li>• Workplace safety and health (WSH) standards and regulations</li> </ul>			

**SKILLS FRAMEWORK FOR PRECISION ENGINEERING  
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

		<ul style="list-style-type: none"> <li>• Approved parts, support and test equipment for repairs and maintenance</li> <li>• Approved procedures for operating and testing hydraulic systems</li> <li>• Workplace safety and health (WSH) standards and regulations</li> </ul>				
<b>Abilities</b>	<ul style="list-style-type: none"> <li>• Plan work activities and requirements, in accordance with organisational procedures</li> <li>• Select and assemble appropriate hydraulic components and connect electrical devices and wiring in accordance with circuit diagram</li> <li>• Check functionality of hydraulic equipment hardware and software</li> <li>• Test and modify hydraulic equipment and systems in accordance with organisational procedures to ensure design meets control requirements</li> <li>• Apply safe work practices while operating and testing the hydraulic systems</li> <li>• Identify and tag faulty and/or unsafe components</li> <li>• Maintain good housekeeping in accordance with WSH practices</li> <li>• Identify serviceable components and/or parts for proper recycling and replace spoilt components with good</li> </ul>	<ul style="list-style-type: none"> <li>• Identify test and support equipment and support documentation required for the tasks</li> <li>• Determine equipment maintenance shut-down periods and inform users of maintenance and/or repair schedules</li> <li>• Verify the availability of test and support equipment and support documentation, in accordance with enterprise procedures</li> <li>• Conduct and record pre-maintenance tests as specified in system documentation</li> <li>• Isolate and shut-down hydraulic systems for maintenance and/or repair</li> <li>• Depressurise or isolate system pressure vessels, in accordance with applicable instructions</li> <li>• Inspect hydraulic system components and conduct maintenance and repair, in accordance with approved procedures</li> <li>• Recharge and reconnect system pressure vessels, in accordance with instructions</li> </ul>	<ul style="list-style-type: none"> <li>• Identify control sequence for designing hydraulic equipment and systems based on control requirements and displacement diagrams</li> <li>• Identify and select required hydraulic components and/or electrical devices based on given control requirements</li> <li>• Perform quality and process checks of computerised hardware and software required for hydraulic equipment and systems design, in accordance with approved written work instructions</li> <li>• Draft hydraulic equipment and system designs to fulfil control requirements, in accordance with ISO symbols</li> <li>• Design hydraulic and electro-hydraulic circuits, in accordance with control requirements</li> <li>• Check completed circuit diagrams, and make necessary amendments, to ensure control requirements are met</li> </ul>			

**SKILLS FRAMEWORK FOR PRECISION ENGINEERING  
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

	<p>conditioned-used, recycled components</p>	<ul style="list-style-type: none"> <li>• 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</li> <li>• Investigate defects and anomalous operations, and record causes to rectify all anomalies and defects</li> <li>• Compile relevant reports in accordance with approved procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare parts list of all components used in hydraulic equipment and systems</li> <li>• Connect hydraulic components, electrical devices and wiring, according to completed circuit diagrams</li> <li>• Activate and test hydraulic equipment and systems, in accordance with established organisational procedures, and make modifications to ensure that control requirements are met</li> <li>• Record testing results of hydraulic equipment and systems</li> </ul>			
--	--	--	--	--	--	--