

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

<b>TSC Category</b>	Manufacturing and Operations					
<b>TSC</b>	Production Shut-down and Re-start					
<b>TSC Description</b>	Manage shutdown and restarting of production process to minimise loss and/or damage of assets as well as ensure the safety of personnel during shut down and restarting					
<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-OPR-3008-1.1</b>	<b>PRE-OPR-4008-1.1</b>		
			Coordinate the shut-down and re-start of the production process in a safe and efficient manner due to a planned or an unplanned shut-down or emergency situation	Manage the shut-down and re-start of a production process while ensuring maximum safety to personnel and minimum impact to plant, environment and the organisation's productivity		
<b>Knowledge</b>			<ul style="list-style-type: none"> <li>Possible causes of unplanned shutdowns that require immediate action</li> <li>Organisation procedures for controlling automatic shut-downs</li> <li>Procedures for assessing emergency situations in the plant</li> <li>Effects of unplanned shut-downs on the control systems</li> <li>Safe handling of equipment to protect oneself and others from risks</li> <li>Importance of minimising any loss and/or damage during shut-down</li> <li>Electrical and mechanical isolation</li> <li>Plant and equipment operating parameters during start-up</li> <li>Commissioning and pre-start checking of various associated equipment</li> <li>Safe de-isolation and commissioning</li> </ul>	<ul style="list-style-type: none"> <li>Principles of operation of plant and/or equipment</li> <li>Routine problems, faults and their resolutions</li> <li>Methods of starting, stopping, operating and controlling process</li> <li>Corrective actions appropriate to the problems' causes</li> <li>Functions and troubleshooting of major components and their problems</li> <li>Types and causes of problems within one's scope of skill level and responsibility</li> <li>Emergency shut-down procedures</li> <li>Procedures relating to plant shut-down and re-start</li> <li>Applicable workplace safety and health (WSH) regulations</li> </ul>		

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			<ul style="list-style-type: none"> <li>• Applicable workplace safety and health (WSH) regulations</li> </ul>			
<b>Abilities</b>			<ul style="list-style-type: none"> <li>• Respond to unplanned shut-downs in plant</li> <li>• Co-ordinate planned shut-downs in plant</li> <li>• Co-ordinate start-up of plant</li> </ul>	<ul style="list-style-type: none"> <li>• Check and verify safety systems to ensure that units have been made safe</li> <li>• Identify the reasons for, or cause of the shut-down by troubleshooting the systems and utilising all available data and information systems</li> <li>• Obtain confirmation of the identified shut-down from production team to verify both the nature and the reliability of the shut-down</li> <li>• Rectify, or initiate procedures to rectify, the faults or causes of shut-down by repairing operational faults or re-adjustments before returning the system to start-up status</li> <li>• Conduct start-up processes, in accordance with organisational and WSH procedures</li> <li>• Record any further ongoing production problems to appropriate persons or authority</li> </ul>		