

<b>TSC Category</b>	Discipline Engineering Specialisation					
<b>TSC</b>	Instrumentation and Control System Maintenance Management					
<b>TSC Description</b>	Interpret and implement maintenance regimes, processes and procedures for programming, configuration and maintenance of control systems to ensure optimal availability and reliability of process plant and equipment					
<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>
			ECM-DEG-3006-1.1	ECM-DEG-4006-1.1		
			Interpret maintenance regimes, processes and procedures for the programming, configuration and maintenance of control systems to maintain control systems in a safe and reliable manner	Facilitate the implementation of maintenance regimes, processes and procedures for the programming, configuration and maintenance of control systems to manage control system maintenance tasks in a safe and reliable manner		
<b>Knowledge</b>			<ul style="list-style-type: none"> <li>• Types of process control systems, hardware, peripheral equipment, and architecture</li> <li>• Process control documentation including hardware connection details and general arrangement and software programming details</li> <li>• Types of communication protocols, including Foundation Fieldbus, Process Field Bus (PROFIBUS), etc.</li> <li>• Principles of control and loop tuning principles</li> <li>• Types of instrument safety protection systems including programmable logic controllers (PLCs), failsafe, fault tolerant</li> <li>• Types of fire and gas detection (FGD) systems</li> </ul>	<ul style="list-style-type: none"> <li>• Control engineering principles</li> <li>• Principles of advanced control and monitoring</li> <li>• Signal conditioning and data processing</li> <li>• Supervisory Control and Data Acquisition (SCADA) and real-time systems</li> <li>• Distributed Control System (DCS) maintenance principles and practices</li> <li>• Industrial communication networks and communication protocols</li> <li>• Advanced transmitters (hard-wired and wireless) and vendor communication protocols</li> <li>• Programmable logic controllers (PLCs) programming, interrogation, diagnostics</li> </ul>		

			<ul style="list-style-type: none"> <li>• Transmitters and controllers</li> <li>• Principles of cause and effect, and troubleshooting integrated systems</li> <li>• Methods of system and equipment configuration and interrogation</li> </ul>	<ul style="list-style-type: none"> <li>and fault finding principles</li> <li>• Principles of fiscal metering, flow computation formulas, hardware and software requirements</li> <li>• Condition-based monitoring systems principles and practices</li> <li>• New technology developments in instrumentation and control systems</li> <li>• Methods of wireless technology, including design, engineering and maintenance requirements</li> </ul>		
<b>Abilities</b>			<ul style="list-style-type: none"> <li>• Perform routine maintenance and monitoring of control systems, intelligent systems and auxiliary equipment</li> <li>• Perform configuration of control system software</li> <li>• Perform process control loop tuning</li> <li>• Perform system troubleshooting of process plants and equipment</li> <li>• Perform interrogation of communication networks including foundation fieldbus, etc.</li> <li>• Perform configuration and interrogation checks on PLC</li> <li>• Perform maintenance checks of Emergency Shutdown (ESD) systems and equipment</li> <li>• Perform maintenance and monitoring checks of</li> </ul>	<ul style="list-style-type: none"> <li>• Supervise routine maintenance and monitoring of control systems, intelligent systems and auxiliary equipment</li> <li>• Supervise and perform configuration of control system software</li> <li>• Supervise and perform system troubleshooting of process plants and equipment</li> <li>• Supervise and perform interrogation of communication networks, including foundation fieldbus, etc.</li> <li>• Supervise and perform configuration and interrogation checks on PLCs</li> <li>• Supervise and perform maintenance checks of Emergency Shutdown (ESD) systems and equipment</li> </ul>		

			fire and gas (F&G) equipment and systems <ul style="list-style-type: none"> <li>• Maintain “As-Built” documentation</li> </ul>	<ul style="list-style-type: none"> <li>• Supervise maintenance and monitoring checks of fire and gas (F&amp;G) equipment and systems</li> <li>• Carry out advanced system interrogation, programming, logic and algorithm upgrades of DCS, PLC and SCADA systems</li> <li>• Carry out advanced diagnostics and troubleshooting to a wide range of instrument equipment and control communication systems</li> </ul>		
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