TSC Category	Automation Management					
TSC	Automation Process Control					
TSC Description	Apply automation process control to monitor performance metrics and quality of manufacturing outputs to determine the optimal settings as well as productivity improvement strategies					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
			PRE-RAO-3004-1.1	**PRE-RAO-4004-1.1**	**PRE-RAO-5004-1.1**	**PRE-RAO-6004-1.1**
			Maintain automation process control to reduce process variations, detect equipment or process deviations for product quality improvement	Analyse multiple process control data sources to manage the process control automation	Design automated control systems to support manufacturing processes	Define the capacity model of equipment using factory automation data as well as equipment performance variations
Knowledge			• Types of manufacturing data sources and control requirements • Types of process control systems and process control algorithms • Process control concepts • Control charts • Process control performance metrics • Process capability indices	• Types of manufacturing data sources and control requirements • Types of process control systems and process control algorithms • Communication data flow between equipment, manufacturing automation and process control automation • Sensor systems, sensor platforms and standards • Process control concepts • Control charts • Process control performance metrics • Process capability indices	• Concept of continuous control • Control strategy design and application • Integration and software • Instrumentation maintenance and troubleshooting • Control documentation • Automatic controls and robotics • Industrial data communications • Cybersecurity on automation system	• Equipment operation and various operating statuses as time models • Manufacturing execution systems (MES) • Concept of overall equipment efficiency (OEE) • Factory layout plan management • Data mining and production capacity modelling
Abilities			• Perform set-up of process control automation, according to standard operating procedures • Maintain process control automation and tune process control algorithms and/or models to meet manufacturing requirements • Monitor process control automation to detect	• Determine standard process control automation to meet manufacturing requirements • Set up process control automation and tune process control algorithms or models to meet manufacturing requirements • Troubleshoot process control automation	• Develop standard instrumentation and control documentation • Tune and refine control loops • Troubleshoot instrumentation and control systems • Design and tune feedback and advanced regulatory control strategies	• Define equipment capacity modelling • Define factory layout plan management • Determine direct labour resources for operations • Recommend productivity improvement strategies • Perform programming work for analysis and simulation

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			equipment or process deviations • Report process control performance	• Implement improvements to process control automation • Analyse and correlate multiple process control data sources from equipment through dynamic central database for process control and improvement	• Design and apply model-based control strategies	• Integrate factory automation systems or robotics on manufacturing shop floor

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