

**SKILLS FRAMEWORK FOR ELECTRONICS
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

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
			ELE-RAO-3003-1.1	ELE-RAO-4003-1.1	ELE-RAO-5003-1.1	ELE-RAO-6003-1.1
Knowledge			Maintain automation process control to reduce process variations, detect equipment or process deviations for product quality improvement <ul style="list-style-type: none"> 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 	Analyse multiple process control data sources to manage the process control automation <ul style="list-style-type: none"> 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 	Design automated control systems to support manufacturing processes <ul style="list-style-type: none"> 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 	Define the capacity model of equipment using factory automation data as well as equipment performance variations <ul style="list-style-type: none"> Equipment operation and the various operating status as time models Manufacturing Execution Systems (MES) Overall Equipment Efficiency (OEE) Factory Layout Plan Management Data Mining and Production Capacity Modelling
Abilities			<ul style="list-style-type: none"> Perform basic set-up of the process control automation according to standard operating procedures Maintain process control automation and tune the process control algorithms or models to meet manufacturing requirements Monitor the process control automation to detect equipment or process deviations Report process control performance 	<ul style="list-style-type: none"> Determine standard process control automation to meet manufacturing requirements Set-up process control automation and tune the process control algorithms or models to meet manufacturing requirements Troubleshoot the process control automation Implement improvements to the process control automation Analyse and correlate multiple process control data sources from equipment through dynamic central database for process control and improvement 	<ul style="list-style-type: none"> 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 Design and apply model-based control strategies 	<ul style="list-style-type: none"> 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 Integrate factory automation systems or robotics in manufacturing shopfloor