

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

TSC Category	Value Engineering					
TSC	Lean Manufacturing					
TSC Description	Apply concepts, tools and techniques of 'lean' manufacturing to improve efficiency in a manufacturing organisation					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
			PRE-OPR-3064-1.1	PRE-OPR-4064-1.1	PRE-OPR-5064-1.1	PRE-OPR-6064-1.1
			Identify and assess actual and potential failures in product and process designs, using methods and tools of 'lean' manufacturing	Manage 'lean' manufacturing within the organisation, through the use of 'lean' tools with materials, processes and machines	Strategise the application of 'lean enterprise' in different functional areas, processes and levels within the organisation	Establish organisational practices in 'lean' manufacturing, with a focus on identifying and eliminating wastes and sources of variability
Knowledge			<ul style="list-style-type: none"> • Cycle-times in workplace operations • Types and characteristics of layout designs in the workplace • Concept of 'poka-yoke' • Steps to create value stream mapping in the workplace • Benefits of process mapping in the workplace • Strategies to implement the business improvement projects • Correlation between 'lean' thinking and productivity • 'Lean' metric for performance measurement • Roles and responsibilities of personnel in a 'lean' project 	<ul style="list-style-type: none"> • Eight types of production wastes • Benefits of lean manufacturing • Performance measurement areas in lean manufacturing • Steps to achieve lean performance results • Objectives of production and inventory control • Types of inventory by function and condition • Lean manufacturing tools for improved inventory flow and material flow • Steps required for successful lean implementation 	<ul style="list-style-type: none"> • Evolution of 'lean' as a business and management practice • Frameworks for 'lean' thinking • Principles and guidelines for creating 'lean' enterprises • Principles and applications of 'lean' • 'Lean' audits • 'Lean' implementation and sustainability • Tools and techniques of 'lean' 	<ul style="list-style-type: none"> • Concepts of 'lean' manufacturing • Principles of 'lean' • Eight types of wastes and major key performance indicators • Tools and techniques of 'lean' • Concept of Plan-Do-Study-Act' (PDSA) cycle • Characteristics of 'lean' organisational structures • Roles and responsibilities of personnel in a 'lean' structure
Abilities			<ul style="list-style-type: none"> • Apply cycle time measurement techniques, according to simulation guides • Simulate types of layout design for activities improvement 	<ul style="list-style-type: none"> • Identify types of waste within the organisation • Perform inventory classification using 'selective inventory control' (ABC analysis) 	<ul style="list-style-type: none"> • Identify suitable frameworks for 'lean thinking' and associated benefits 'lean' approaches can afford the organisation • Design 'lean' enterprise models 	<ul style="list-style-type: none"> • Identify critical wastes in specific functional areas, processes and/or levels within the organisation • Collect data on operations and wastes

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			<ul style="list-style-type: none"> • Apply value stream mapping in the workplace according to simulation guide • Apply process mapping for understanding activities flow • Identify and implement business improvement projects • Interpret 'lean' thinking to eliminate wastes and increase value-added activities • Apply the five principles of 'lean' as a framework for improvement activities • Identify eight types of wastes in the workplace • Carry out waste elimination activities in the workplace 	<ul style="list-style-type: none"> • Calculate economic batch quantity and number of 'kanbans' required • Calculate production capacity and TAKT time • Determine the need for preventive maintenance within the organisation • Implement lean manufacturing at various levels in the organisation and within various areas for improvement 	<ul style="list-style-type: none"> • Critically evaluate how 'lean thinking' may apply in different functional areas, processes and levels within the organisation • Recommend appropriate approaches to implement sustainable 'lean enterprise' within the organisation • Identify and apply appropriate tools and techniques to support a 'lean' enterprise' within the organisation 	<ul style="list-style-type: none"> • Measure levels of waste generated • Analyse root causes of waste • Formulate implementation plans for organisational 'lean' manufacturing • Formulate lean organisational structures
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