



Australian Government

MEM23123 Evaluate manufacturing processes

Release: 1

MEM23123 Evaluate manufacturing processes

Modification History

Release 1. Supersedes and is equivalent to MEM23123A Evaluate manufacturing processes.

Application

This unit of competency defines the skills and knowledge required to evaluate plant, facilities, services, labour and skills distribution used for manufacturing processes against defined process performance parameters. It includes the evaluation and assessment of plant layout and material flows for efficient manufacturability of product and maintainability of the plant and process.

This unit applies to manufacturing processes for products, machinery, tools or components for structures. Evaluations can be required for a variety of reasons, including assessing impact of proposals for new products or investigating potential change in processes to meet regulatory, sustainability or efficiency requirements. These evaluations are based on lean systems and techniques. Where more in-depth training in lean systems and techniques is required, relevant competitive systems and practices units from the MSS Sustainability Training Package should be selected.

The unit is suitable for people working as supervisors, technicians and design draftspersons, and for those pursuing manufacturing, engineering or related technical qualifications and careers.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine scope of manufacturing processes	1.1 Identify manufacturing context and processes 1.2 Identify features and functions of plant, facilities, services, labour and skill distribution used in manufacturing processes

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Identify stakeholders to be consulted as part of the evaluation 1.4 Confirm work health and safety (WHS) and regulatory requirements, codes of practice, standards, risk assessment and registration requirements for manufacturing plant 1.5 Investigate sustainability implications of manufacturing processes 1.6 Identify sources of professional and technical assistance
2. Evaluate manufacturing processes	2.1 Identify manufacturing principles and techniques required to evaluate and optimise the processes 2.2 Identify appropriate analysis techniques, software and software validation techniques 2.3 Evaluate and assess facilities, services, plant and tooling in relation to product manufacturability and maintainability 2.4 Evaluate and assess process layout, use of automation and process control using lean systems and techniques 2.5 Evaluate and assess materials, product flow and transfer operations, buffer and emergency stocks, warehousing, stores and logistics using lean systems and techniques 2.6 Evaluate WHS and regulatory compliance and risk management practices of manufacturing processes and maintenance procedures 2.7 Evaluate processes for sustainability 2.8 Evaluate process compatibility with maintenance management system 2.9 Evaluate labour requirements and skills distribution 2.10 Evaluate process information flows for control and process improvement
3. Report results	3.1 Review results of evaluation and assessment with stakeholders 3.2 Provide recommendations for improvements based on evaluation 3.3 Provide reports and documentation including layouts, programs and flow charts

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Defined parameters include:	- target cost and target outgoing quality levels and warranty costs - production rates - stock levels and availability to customer order - productivity and plant utilisation - working capital.
Context of manufacturing processes includes:	- customer requirements - market considerations - product and process sustainability - lean systems - product manufacturability - system maintainability - facilities, services, plant and tooling requirements - supply chains - material and product flow - transfer operations - process control - labour requirements and skills distribution - information flow - systems thinking - continuous improvement and constraint and contingency management - WHS and regulatory requirements and risk management.
Automation safety includes:	- emergency stop - failsafe design - redundancy - interlocks - data integrity.
Appropriate technical and professional assistance includes:	- technical support and advice relating to elements which have intrinsic dangers including: - high pressure

	- energised fluid vessels - high temperatures and heat energy capacity - wiring with high current control voltages above extra low voltage - professional support for technologies including: - specialist electric motor drives and controllers - specialist materials, plastics, metal alloys and nano materials - special processes, foundry, alloy welding, heat treatment, sealing and fastening.
WHS, regulatory requirements, codes of practice and organisational procedures include:	- WHS acts, regulations and relevant standards - codes of practice from Australian and overseas engineering and technical associations and societies - risk assessments - registration requirements - safe work practices - state and territory regulatory requirements applying to electrical work.
Sustainability includes:	- meeting all regulatory requirements - conforming to all industry covenants, protocols and best practice guides - minimising ecological and environmental footprint of process, plant and product - maximising economic benefit of process plant and product to the organisation and the community - minimising the negative WHS impact on employees, community and customer.
Continuous improvement implementation includes:	- changes to plant, facilities, services, layout, materials flows, handling and logistics - techniques including: - balanced scorecard - current and future state mapping - measuring performance against benchmarks - process improvement, problem solving and decision making - data management, generation, recording, analysing, storing and use of software - training for improvement systems participation - technical training - systems thinking - constraints and contingency management.
Lean systems and techniques include one or	- performance indicators based on customer value - continuous improvement, including kaizen

more of the following:	• just-in-time (JIT) and Kanban • pull system for production and services • elimination and/or limitation of waste, where waste is defined as effort and resources not contributing to customer value • mistake proofing • standardisation of work • quick changeover • planning benchmarks and techniques including: • cycle time and task time • pack out • pitch • line balancing • overall equipment effectiveness (availability x performance efficiency x quality rate) • problem-solving and decision-making tools including: • total quality management (TQM) tools • root cause analysis (RCA) • failure mode and effects analysis (FMEA) • design review based on failure mode (DRBFM) • constraints and contingencies management • total productive maintenance • value stream analysis • visual factory techniques.
Automation includes one or more of the following:	• islands of automation supported by manual interfaces with some electronic information processing • systems with major automation and networked data handling.
Information flow requirements include:	• statistical process control (SPC) and quality assurance (QA) data • production planning and maintenance systems information • visual information feedback to stakeholders • software and networks for automated data handling, analysis, display and storage.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23123A Evaluate manufacturing processes.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM23123 Evaluate manufacturing processes

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- determining features and functions of manufacturing processes including manufacturing principles and techniques used and relevant internal and external context of manufacturing processes
- identifying and applying relevant lean systems and techniques in evaluation of manufacturing processes
- evaluating work health and safety (WHS), regulatory, automation safety and risk management compliance
- investigating sustainability implications of manufacturing processes
- evaluating software, facilities, services, plant and equipment tooling, process layout, automation and process control on at least two occasions
- identifying appropriateness of materials and product flow and transfer operations, buffer and emergency stocks, warehousing, stores and compatibility of maintenance management system on at least two occasions
- reporting and documenting results of evaluation with required layouts, programs and flow charts.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- evaluation parameters
- technical and professional assistance
- context of manufacturing processes
- important features of products and processing options with regard to:
 - marketing options and advantages
 - economic, social and sustainability implications of products and processes
 - WHS and other regulatory requirements
- plant, facilities, services and process layout
- common modern manufacturing technical and work organisation processes including:
 - volume production using transfer lines

- cellular manufacturing
- jobbing
- metal shaping processes including casting, forging and machining
- metal assembly, fabricating and joining
- plastic and rubber product manufacturing including various types of moulding and assembly
- surface finishing-based processes
- process transfers and materials handling
- packaging
- warehousing, stores, and provision for logistics and transport
- labour and skills distribution requirements of plant and processes
- asset maintainability and reliability concepts and processes
- process automation and control options
- techniques for process improvement including:
 - material and product flow measurement and improvement
 - feedback on product manufacturability for possible product modification
 - feedback from maintenance and life cycle costs for plant
 - quality assurance (QA), quality control (QC) and statistical process control (SPC) feedback
 - customer feedback on cost, quality, delivery and reliability
- maintenance management systems and compatibility with manufacturing processes
- information flows and software options for process measurement and control
- budgeting and costing processes
- WHS, risk management, safe work method statements (SWMS), work permits, safety data sheets (SDS), codes of practice, regulations, standards and regulatory requirements.
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Assessment Conditions

- Assessors must:
 - have vocational competency in evaluating manufacturing processes at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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