



**Australian Government**

**MEM22014A Coordinate  
engineering-related manufacturing  
operations**

**Release 1**

# **MEM22014A Coordinate engineering-related manufacturing operations**

## **Modification History**

Release 1 - New unit. Replaces MEM22005A, but not equivalent.

## **Unit Descriptor**

This unit of competency covers the skills and knowledge required to coordinate, monitor and maintain engineering-related manufacturing operations, including the coordination of purchasing, scheduling of materials and resources, achievement of budget with control of processes, physical resources, maintenance of operations and assets, performance analysis and process improvement, work health and safety (WHS) and risk management.

## **Application of the Unit**

This unit applies to people with coordination and facilitation responsibilities for significant manufacturing operations.

Where the planning, scheduling and purchasing is done in an engineering or manufacturing organisation following lean principles, it is recommended that appropriate competitive systems and practices units of competency also be selected.

The unit applies where the coordination role involves application of engineering skills and knowledge to ensure safe, effective and efficient manufacturing and can include specific engineering-related tasks, such as installation and commissioning of plant, design of equipment and major overhauls.

The coordination role of the unit includes monitoring engineering and other technical performance parameters against the project plan as well as monitoring other project parameters that impact on engineering and technical compliance of the project. These include finance, accounting, budgeting and control, resourcing, tenders, contracts, WHS, risk management, human resources, and legal and regulatory requirements.

For coordination skills for time-defined engineering projects see unit MEM22013A Coordinate engineering projects.

## **Licensing/Regulatory Information**

Not applicable.

## Pre-Requisites

MEM23004A	Apply technical mathematics
MEM14091A	Integrate manufacturing fundamentals into an engineering task

## Employability Skills Information

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency. Performance criteria describe the performance needed to demonstrate achievement of the element.

## Elements and Performance Criteria

1	Develop the production plan	1.1	Coordinate development of, or obtain, demand forecast
		1.2	Participate in preparation of production plan in consultation with relevant stakeholders to meet quality, demand and delivery timelines within capacity and budget constraints
		1.3	Coordinate preparation of purchasing schedules
		1.4	Coordinate preparation of production schedules, including allowances for scheduled maintenance and any required shutdown periods
		1.5	Coordinate development of risk management and contingency procedures
		1.6	Review production plan with relevant stakeholders and adjust, as necessary
		1.7	Coordinate development of key performance indicators (KPIs) and monitoring procedures with relevant stakeholders
		1.8	Incorporate professional and technical assistance, as required

- 2 Coordinate the implementation of the production plan
  - 2.1 Allocate responsibilities for purchasing and detailed scheduling, including communication of priorities and KPIs
  - 2.2 Coordinate materials and product flow and transfer operations to meet plan requirements, including buffer and emergency stocks, warehousing, stores and logistics
  - 2.3 Monitor quality and process control procedures
  - 2.4 Coordinate and monitor physical, human and financial resources, and budget to achieve production plan
  - 2.5 Review and monitor information and reporting procedures to stakeholders
  - 2.6 Address systems constraints and contingencies and adjust short-term planning and reschedule, as necessary
  
- 3 Monitor operational performance
  - 3.1 Review actual indicators against KPIs
  - 3.2 Review manufacturing operations against production plan and other KPIs
  - 3.3 Participate in continuous improvement procedures, including lean operation principles and procedures, where implemented
  - 3.4 Monitor preventative and breakdown maintenance and review impact on operational performance
  - 3.5 Monitor implementation of risk management procedures during non-conformances and adjust, as required, in accordance with organisational procedures
  - 3.6 Report progress against production plan in accordance with procedures
  - 3.7 Provide documentation, data entry and analysis, as required

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Required skills include:

- identifying equipment and process capacity from information supplied by designers and suppliers
- developing production schedule demand forecast from information supplied by customers, distributors, and sales and marketing departments
- preparing master production, schedule or project plan
- detailed operations planning, scheduling, production control and contingency measures that take into account:
  - facilities
  - services
  - plant and tooling
  - enterprise resource planning (ERP) software
  - process layout
  - use of automation
  - product manufacturability
  - asset maintainability
- preparing purchasing schedules and coordinating material supplies
- complying with WHS and regulations, codes of practice, standards and risk assessment
- coordinating manufacturing operation to be consistent with business plans and legal and regulatory requirements, and coordinating systems maintenance of manufacturing operation following improvement procedures
- use of software, such as ERP, system control data acquisition (SCADA) and spreadsheets, where installed
- coordinating manufacturing operations to schedule and priority
- maintaining quality and process control procedures
- coordinating problem solving and decision making, short-term planning and rescheduling to meet constraints and contingencies, as necessary
- maintaining records, reporting and documenting in accordance with procedures

### Required knowledge

Required knowledge includes:

- manufacturing management systems
- forecasting, scheduling and production control procedures

- production systems, including assembly and process layouts, material and product flows, automation and control systems
- WHS requirements, codes of practice, regulations, standards, regulatory requirements, risk management, current safe work methods statements (SWMS), material safety data sheets (MSDS) and work permits
- budgeting, costing and control measures
- quality and process control measures
- asset maintenance techniques and management options
- continuous improvement procedures
- problem solving and decision making, systems thinking, contingency and constraints management as applied to manufacturing
- requirements for and functions of technical documentation, graphics and specifications
- sustainability implications of manufacturing operations, products and processes, including social, environmental, resources and economic implications
- reporting and documenting procedures used in manufacturing, including role of standard operating procedures, engineering drawings and process control charts

## Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

<b>Overview of assessment</b>	A person who demonstrates competency in this unit must be able to coordinate, monitor and maintain an engineering-related manufacturing operation, including purchasing, scheduling of materials and resources and priorities. This includes working individually and as part of a team and recognising and complying with normal organisation control procedures.
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> <li>• prepare production or project plan in consultation with relevant stakeholders to meet WHS, quality, demand and delivery requirements within capacity and budget constraints</li> <li>• apply procedures to ensure compliance of manufacturing operations with WHS, environmental and other regulatory requirements</li> <li>• review and monitor facilities and services, including: <ul style="list-style-type: none"> <li>• plant, tooling and software</li> <li>• process layout</li> <li>• use of automation and automation safety</li> <li>• product manufacturability and asset maintainability</li> <li>• compliance requirements of WHS and regulations, codes of practice, standards, risk assessment and registration requirements for manufacturing plant.</li> </ul> </li> </ul>
<b>Context of and specific resources for assessment</b>	<ul style="list-style-type: none"> <li>• This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, then a simulated working environment must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.</li> <li>• Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</li> <li>• Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</li> </ul>
<b>Method of assessment</b>	<ul style="list-style-type: none"> <li>• Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package.</li> </ul>

	<ul style="list-style-type: none"> <li>• Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.</li> <li>• Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application.</li> <li>• Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.</li> <li>• Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.</li> <li>• Assessment may be in conjunction with assessment of other units of competency where required.</li> </ul>
<b>Guidance information for assessment</b>	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<b>Relevant stakeholders</b>	<p>Relevant stakeholders may include:</p> <ul style="list-style-type: none"> <li>• team</li> <li>• organisation functional groups</li> <li>• support professionals and licensed technicians</li> <li>• customers and suppliers</li> </ul>
<b>WHS, regulatory requirements and enterprise procedures</b>	<p>WHS, regulatory requirements and enterprise procedures may include:</p> <ul style="list-style-type: none"> <li>• WHS Acts and regulations</li> <li>• relevant standards</li> <li>• codes of practice from Australian and overseas engineering and technical associations and societies</li> <li>• risk assessments</li> <li>• registration requirements</li> <li>• safe work practices</li> <li>• state and territory regulatory requirements</li> </ul>



<b>Records</b>	<p>Records may include:</p> <ul style="list-style-type: none"> <li>• forecasts, schedules and budgets</li> <li>• records of operations, production quantities, quality and supply performance</li> <li>• process, resources and budget control measures</li> <li>• communications, graphics and specifications</li> <li>• tenders, contracts and schedules</li> <li>• personnel, resource allocations and financial management procedures</li> <li>• standard operating procedures, including maintenance procedures</li> <li>• records of procedures and legislative compliance</li> </ul>
<b>Appropriate licensed technical and professional assistance</b>	<p>Appropriate licensed technical and professional assistance may include:</p> <ul style="list-style-type: none"> <li>• technical support and advice relating to elements which have intrinsic dangers, such as: <ul style="list-style-type: none"> <li>• high pressure</li> <li>• energised fluid vessels</li> <li>• high temperatures and heat energy capacity</li> <li>• wiring or devices with high current or voltages above extra low voltage</li> </ul> </li> <li>• professional support for engineering research, calculations and technologies <ul style="list-style-type: none"> <li>• professional services in non-engineering related areas, such as: <ul style="list-style-type: none"> <li>• finance, accounts and tax</li> <li>• insurance and legal</li> <li>• training and human resources</li> </ul> </li> </ul> </li> </ul>
<b>Continuous improvement procedures</b>	<p>Continuous improvement procedures may relate to plant, products, processes, systems or services, including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance.</p> <p>Improvement processes may include techniques, such as:</p> <ul style="list-style-type: none"> <li>• balanced scorecard</li> <li>• current and future state mapping</li> <li>• measuring performance against benchmarks</li> <li>• process improvement, problem solving and decision making</li> <li>• data management, generation, recording, analysing, storing and use of software</li> <li>• training for improvement systems participation</li> <li>• technical training</li> </ul>
<b>Constraints and</b>	Contingencies arising during operations or improvement projects will

<b>contingencies</b>	<p>have constraints on possible solutions. These may be:</p> <ul style="list-style-type: none"> <li>• financial</li> <li>• organisation procedural or culture</li> <li>• physical constraints, such as limits to resources, limits to site access or logistical limitations</li> </ul>
<b>Systems thinking</b>	<p>Systems thinking refers to the conduct of engineering work in a manner that demonstrates knowledge of how the interaction of different technical systems on equipment, machinery or structures, as well as the skills and techniques of personnel, combine to perform or support engineering-related operations, processes or projects. It embraces determining or establishing how the function of each technical system or component, as well as the skills and techniques of personnel, effects or potentially may effect, outcomes. Systems should be interpreted broadly within the context of the organisation and depending on the project or operation can include equipment, related facilities, material, software, internal services and personnel, and other organisations in the value chain</p>
<b>Lean manufacturing</b>	<p>Lean manufacturing uses cost, capacity and responsiveness, quality, reliability and waste minimisation as drivers of the process and measures for process improvement. Lean manufacturing is the response of many organisations to local, regional, national and global market competitiveness</p>
<b>Software options</b>	<p>Software may be employed for forecasting, scheduling performance analysis/modelling and may include:</p> <ul style="list-style-type: none"> <li>• ERP</li> <li>• SCADA</li> <li>• spreadsheets</li> </ul>
<b>Sustainability</b>	<p>Sustainability is used to mean the entire sustainable performance of the organisation/plant, including:</p> <ul style="list-style-type: none"> <li>• meeting all regulatory requirements</li> <li>• conforming to all industry covenants, protocols and best practice guides</li> <li>• minimising ecological and environmental footprint of process, plant and product</li> <li>• maximising economic benefit of process plant and product to the organisation and the community</li> <li>• minimising the negative WHS impact on employees, community and customer</li> </ul>

## **Unit Sector(s)**

### **Competency field**

**Unit sector**            Management and organisation

## **Custom Content Section**

Not applicable.