Australian Government

MEM234001A Plan and manage engineering-related projects or operations

Release: 2

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MEM234001A Plan and manage engineering-related projects or operations

Modification History

Release 2 - Replacement of text missing from Element 3 PCs. Equivalent.

Unit Descriptor

This unit of competency covers the skills associated with high level planning and management of engineering-related projects or operations. The unit covers the skills required to plan, establish, maintain and manage complex engineering systems and resources associated with time-defined engineering-related projects or high level engineering operations management in a manufacturing or engineering-related organisation.

Application of the Unit

This unit applies to the planning and management of engineering-related projects or operations. Activities include significant project or operations management responsibilities and may require personal and electronic communication, self-directed and group activities, business planning, project or operations planning and scheduling, and an understanding of the technology, skills and techniques, and quality aspects required by the project or operations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Establish parameters for project or operations management	1.1	Establish budget and control measures for project or operations to conform to the business plan
		1.2	Prepare project or operations management plan to conform with the business plan
		1.3	Establish procurement requirements
		1.4	Establish the need and provide for appropriate technical and professional assistance
		1.5	Establish physical resources requirements
		1.6	Establish human resources and skills development requirements
		1.7	Establish compliance and environmental requirements for project or operation, including occupational health and safety (OHS) requirements, codes of practice, regulations, standards and other regulatory requirements, and enterprise procedures
		1.8	Carry out required project and operations modelling and calculations using appropriate modelling and analysis software
2	Implement project or operations management plan	2.1	Select an appropriate team and establish communication and cooperation within the team
		2.2	Review and agree on plans, schedules and requirements with the team, assign responsibilities within the team, and establish other functional groups and expert support, as required
		2.3	Determine internal and external reporting requirements,

			including content, regulatory compliance, schedule and sign-off arrangements
		2.4	Establish suppliers, contractors and delivery schedules
		2.5	Arrange for any required recruitment and training of employees
3	Monitor and review accountability for project or operations implementation	3.1	Monitor, review and maintain records of operations or project for accountability against the project objectives, and schedule and cost budget, including required quality outcomes
		3.2	Monitor, review and maintain records of regulatory compliance, including enterprise agreements or awards, OHS, codes of practice and other legislative requirements, environmental and social obligations, and ethical practice
		3.3	Maintain records of professional, trades and industry contacts, sources of information and resources used in the implementation of the project or operation
		3.4	Establish, monitor and review a schedule of procurement requirements and associated contracts and any installation requirements
4	Manage progress of implementation	4.1	Establish mechanisms to manage constraints and contingencies, including coordination with team members, project stakeholders and contractors
		4.2	Adjust short-term planning and schedules, as required
		4.3	Manage technical support, specialist and professionals services to meet schedules, budgets and quality and performance requirements
		4.4	Apply principles of continuous improvement to implementation
		4.5	Document the project outcomes against the project requirements, as required
		4.6	Supervise the completion of project, including sign-off and completion of required documentation of the project, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- ensuring project or operations activities are accurately identified and implemented in priority order in accordance with implementation schedules
- investigating and validating the suitability of performance analysis, modelling and simulation software
- identifying potential implications for the project or operation from non-engineering contexts, including:
  - competitive environment for the organisation
  - customer and supplier relationships
  - labour and skill supply and demand
  - industrial relations
  - regulatory environment
- managing complex engineering-related projects and operations
- managing the interrelationships between concurrent engineering techniques, electronic data control and supervisory systems
- managing roles, responsibilities and levels of authority, and delegating, as appropriate, to team members and in accordance with project and operation schedules
- evaluating projects and operations for feasibility against business plan, including relevant engineering and financial calculations and analysis
- communicating, negotiating and reviewing actions with relevant stakeholders and team members

Required knowledge

Required knowledge includes:

- personal authorities and priorities for projects or operations
- current options and trends in performance analysis, project and financial modelling, engineering-related modelling and simulation software, including underpinning program and software validation techniques
- budget and control measurement and analysis techniques for project or operations management
- project plan and schedule from project design activities
- physical resource availability for project or operations
- human resource/skills availability for engineering-related projects

- accountability – audit, recording and implementation requirements for projects or operations, such as tenders, contracts, schedules, budgets, personnel and resource allocations, and financial management procedures and standard operating procedures, including maintenance procedures
- technical documentation management, graphics and specifications and records of meetings, communications, negotiations, and decisions and agreements with stakeholders
- sources of information and resources, including:
  - professional services
  - finance
  - accounts
  - taxation
  - legal
  - insurance
  - human resources
  - trade and industry contacts
- contemporary contingency and constraints management approaches
- implications for engineering projects or operations associated with typical financial planning and accounting processes which may relate to an engineering project or operation such as:
  - capital flow and liquidity
  - assets and liabilities
  - depreciation
  - balance sheet
  - costing
  - budgeting and cost control
  - break-even analysis
  - profit and loss
  - capital investment and return on investment
  - financial record keeping procedures for expenditures
- typical legal requirements for engineering-related projects or operations
- OHS requirements, codes of practice, regulations, standards and regulatory requirements for project or operations
- risk management and reduction, current safe work methods statements, material safety data sheets (MSDS) and work permits
- professional and ethical practice
- tendering and contracts requirements and processes, including agreement on design and specification, negotiations and optimisations, provisions for variations, delays and penalties
- work organisation and management theory
- conflict resolution, problem solving and decision making

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: • identify, plan and establish engineering and organisation requirements for the project or operation • establish resources required, including labour, materials, equipment within budgets, and procedures • investigate and validate performance analysis, modelling and simulation software • commence project or operation management, including establishing support team and responsibilities • overcome constraints and contingencies to achieve schedules and budgets as contained in business plan • undertake appropriate internal and external reporting • manage continuous improvement.
Context of and specific resources for assessment	• This unit may be assessed on the job, or a combination of both on and off the job assessment based on appropriate project and simulation activities. Where assessment occurs off the job, that is, the candidate is not in productive work, 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. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • 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.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • 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. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency

	is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	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.

Engineering-related projects or operation	Engineering-related projects or operations may occur in a wide variety of industries, for example: • manufacturing • defence • transport and logistics • health • utilities The distinguishing feature for the engineering-related project or operation, as it applies to this unit, is that the project or operations management requires high level para-professional engineering skills in an established engineering discipline or area
Business plan	Business plan means a plan for either a time-defined project or an ongoing engineering-related operation that: • is approved by the client or management of the organisation • contains budgets and which has financial and performance targets • specifies a project or operational schedule • specifies stakeholder reporting/approval mechanisms and degree of autonomy for decision making • specifies any legal requirements or other resources available or required to be established
Appropriate technical and professional assistance	Appropriate technical and professional assistance may include: • technical support and advice relating to elements which have intrinsic dangers, for example:

	• high pressure • energised fluid vessels • high temperatures and heat energy capacity • wiring or devices with high current or voltages above extra low voltage • professional support for technologies, such as: • specialist electric motor drives and controllers • specialist materials, plastics, metal alloys and nano materials • special processes, foundry, alloy welding, heat treatment, sealing and fastening • professional services for: • finance, accounts and tax • insurance and legal • training and human resources (HR)
OHS requirements, codes of practice, regulatory requirements and enterprise procedures	OHS, codes of practice, regulatory requirements and enterprise procedures may include: • OHS Acts and regulations • 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
Appropriate modelling and analysis software	Appropriate modelling and analysis software may include: • project tracking • financial modelling, analysis and tracking • process modelling and analysis • engineering simulation and modelling • manufacturing operation simulation
Records of operations or project	Records of operations include: • tenders, contracts and schedule • personnel, resource allocations and financial management procedures • standard operating procedures, including maintenance procedures • OHS committee minutes and actions • risk management and mitigation • documentation and records of current safe work methods statements • MSDS, work permits, standards and codes of practice • Audits

	• Meetings and communications • graphics and specifications
Manage constraints and contingencies	Contingencies arising during operations or improvement projects are responded to in the context of constraints. Contingencies may threaten operations or improvement projects and planning for contingencies may be essential to maintain resources, skilled labour and schedules. Each contingency will have constraints on possible solutions. These may be: • financial, organisation procedural or culture constraints • physical constraints, such as limits to resources, limits to site access or logistical limitations
Legislative requirements	Legislative requirements may include: • industrial law and awards • customer protection law • restrictive trade practice • environmental protection • workers compensation • equality and anti-discrimination • contract law
Continuous improvement	Continuous improvement may relate to plant, products, processes, systems or services, including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance. Improvement processes may include techniques such as: • 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

Unit Sector(s)

Engineering practice

Custom Content Section

Not applicable.