



Australian Government

Department of Education, Employment and Workplace Relations

MEM234031A Manage installation, commissioning or modification of machines and equipment

Release: 1

MEM234031A Manage installation, commissioning or modification of machines and equipment

Modification History

New unit

Unit Descriptor

This unit of competency covers the skills and knowledge required to provide the technical leadership role in the installation, commissioning or modification of machines and equipment. It includes interpreting manufacturer specifications, implications of relevant regulations, internal or external client brief, liaison with designers, and ensuring that team members are aware of technical and performance requirements.

Application of the Unit

This unit applies to the installation, commissioning or modification of significant machines and equipment across all forms of manufacturing and engineering. The unit applies to individuals who are required to provide high level technical leadership to other members in the installation, commissioning or modification team. The other members of the team will normally include engineering tradespersons and may also include technicians and production personnel.

The unit complements the more general technical leadership and management skills found in MEM234001A Plan and manage engineering-related projects or operations. Informal technical or engineering advice situations are covered by the unit MEM234030A Provide specialised technical and engineering guidance to other technical employees.

This unit does not supply all technical skills and knowledge required for machine and equipment installation, commissioning or modification tasks. The required technical skills will depend on the particular task and will normally be covered through selection of relevant technical units as well as the combined skills and knowledge of the team. However, the unit presumes engineering skills and knowledge to at least Advanced Diploma level.

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	Identify scope of machine installation, commissioning or modification task	1.1	Examine machine and equipment drawings, manufacturer's manuals and other technical data on machines and equipment
		1.2	Determine performance and production requirements expected from machines and equipment after installation, commissioning or modification
		1.3	Determine relevant regulatory requirements
		1.4	Inspect site and determine appropriateness of structural supports, ventilation, services, security and other critical requirements
		1.5	Determine mechanical, electrical, fabrication and machine control skills and task requirements
		1.6	Produce or review installation, commissioning or modification schedule
2	Brief team on requirements	2.1	Distribute and discuss drawings, schedules, and major materials and equipment with team
		2.2	Arrange for request for further information (RFIs) with designers, where required
		2.3	Brief team on key compliance and risk factors, including regulatory, occupational health and safety (OHS) and environmental requirements
		2.4	Agree with team on critical control points and reporting

		requirements	
3	Commence installation, commissioning or modification task	3.1	Supervise machine and equipment shutdowns required for task
		3.2	Supervise unloading of any new machines, equipment and materials required for task
		3.3	Check and determine that supply of services to work are adequate for task commencement
		3.4	Ensure all tradespersons have correct drawings
4	Monitor progress and deal with contingencies	4.1	Establish procedures to ensure assembly and connections are against drawing specifications
		4.2	Ensure electrical, fluid power, and control systems and circuits are consistent with specifications and regulations
		4.3	Identify problems and contingencies and establish and rectify root cause
5	Finalise installation, commissioning or modification	5.1	Conduct final check to ensure installation, commissioning or modification is consistent with drawings, manufacturer manuals and any regulatory requirements
		5.2	Conduct test run of equipment
		5.3	Identify and correct any malfunctions or errors in required output
6	Conduct handover and finalise documentation	6.1	Brief client and operators on machine or equipment operation after installation
		6.2	Prepare and submit any required reports on installation, commissioning or modification

Required Skills and Knowledge

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

Required skills

Required skills include:

- performing responsibilities in priority order in accordance with implementation schedules
- investigating and validating performance analysis, modelling and simulation software
- interpreting machine and equipment design and detailed drawings, including the ability to:
 - identify materials and surface finishes used or required
 - apply assembly, fabrication and construction techniques used in the existing machinery or equipment and required for the installation, commissioning or modification task
 - identify systems and features of the machinery and equipment
- identifying sustainability and environmental issues and implications for the installation, commissioning or modification task
- selecting and using software and validation techniques, including 2-D and 3-D modelling
- identifying problems that require solutions involving computations, such as rate of change, moments of inertia and friction forces, and arranging for, or undertaking, the required computations
- identifying situations and issues that require additional technical or professional assistance
- evaluating solutions for feasibility against the installation, commissioning or modification criteria, including relevant engineering, and financial calculations and analysis
- selecting materials, equipment and sub-assemblies based on availability, price and performance characteristics
- establishing budget and control measures for team, and incorporating within installation, commissioning or modification project control plan
- delegating roles, responsibilities and levels of authority, as appropriate, to team members
- communicating, negotiating and reviewing with stakeholders and team members throughout duration of installation, commissioning or modification project

Required knowledge

Required knowledge includes:

- purpose of and range of systems typically found in modern machinery and equipment including:
 - hydraulics
 - pneumatics
 - electrical motors, electrical supply and associated equipment
 - electronics, mechatronics and other control systems

- mechanical transmissions, including gears, shafts and clutches
- force and stress analysis techniques
- requirements for, and functions of, technical documentation, graphics and specifications and records of meetings, communications, negotiations, decisions and agreements with stakeholders
- 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
- 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.

<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none">• determine features of machines or equipment, OHS, regulatory and risk management requirements both before and after installation, commissioning or modification• lead a multi-disciplinary team• measure, model, calculate and analyse using software and validation techniques• analyse drawings and manufacturer specifications to determine machine and equipment systems and components• determine steps and processes needed for machine and equipment installation• determine steps and processes needed for machine and equipment commissioning• determine steps and processes needed for machine and equipment modification• innovate and create solutions to engineering-related contingencies• verify machine and equipment performance to specifications after installation, commissioning or modification• communicate, negotiate and review with stakeholders and client throughout installation, commissioning or
---	--

	modification process.
--	-----------------------

<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • 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, 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.
<p>Method of assessment</p>	<ul style="list-style-type: none"> • 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.
<p>Guidance information for assessment</p>	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

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.

<p>Installation, commissioning or modification</p>	<p>Installation, commissioning or modification refers to machinery and equipment projects that have the following features:</p> <ul style="list-style-type: none"> • the performance of the whole machine or equipment must be verified against drawings, client brief and manufacturer specifications at the conclusion of the project • skills and knowledge above the trade level are required for planning and supervising the installation, commissioning or modification project • work is conducted against a formal design
<p>RFIs</p>	<p>RFIs are formal queries to designers seeking clarifications or additional information to enable the installation, commissioning or modification project to proceed</p>
<p>Appropriate technical personnel and professionals</p>	<p>Appropriate technical and professional assistance may include:</p> <ul style="list-style-type: none"> • technical support and advice relating to elements which have intrinsic dangers, such as: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • finance, accounts and tax • insurance and legal • training and human resources (HR)
<p>OHS, regulatory, sustainability and</p>	<p>OHS, regulatory, sustainability and environmental issues</p>

environmental issues	may include: <ul style="list-style-type: none">• OHS Acts and regulations• relevant standards• industry codes of practice• risk assessments• registration requirements• safe work practices• 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 OHS impact on employees, community and customer• state and territory regulatory requirements
-----------------------------	---

Unit Sector(s)

Engineering practice

Custom Content Section

Not applicable.