



Australian Government

MEM234032 Manage fluid power-related technologies in an organisation

Release: 1

MEM234032 Manage fluid power-related technologies in an organisation

Modification History

Release 1. Supersedes and is equivalent to MEM234032A Manage fluid power related technologies in an enterprise.

Application

This unit of competency defines the skills and knowledge required to provide a technical leadership role in the installation, maintenance and productivity, quality enhancement of fluid power-related technologies in an organisation.

It includes awareness of current options and trends in fluid power design, interpreting manufacturer specifications, production requirements and determining implications of relevant regulations and internal or external client brief. It also includes liaison with designers and ensuring that team members are aware of technical and performance requirements.

This unit applies to technicians who provide high-level technical leadership in an organisation in relation to fluid power control systems, hydraulic systems, including hydrostatic transmissions, proportional and servo valve control, and programmable logic controller (PLC) control.

The unit covers the fluid power technologies in equipment including robotics, fluid power drives, mobile equipment using fluid power including earthmoving equipment, compressors, pumps, and compressed air distribution systems across all forms of manufacturing and engineering.

The unit complements the more general technical leadership and management skills found in unit MEM234001 Plan and manage engineering-related projects or operations. Informal technical or engineering advice situations are covered by the unit MEM234030 Provide specialised technical and engineering guidance to other technical employees.

This unit does not reflect all technical skills and knowledge required for fluid power- related tasks. The required technical skills will depend on the task and will normally be covered through the combined skills and knowledge of the team. However, the unit presumes engineering skill and knowledge to at least Advanced Diploma level.

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. Identify scope of fluid power related systems installation, commissioning or modification task	1.1 Review machine and equipment drawings, manufacturer manuals and other technical data for fluid power systems specifications 1.2 Determine performance and production requirements expected from fluid power equipment 1.3 Determine if any commissioning or modification of fluid power systems is required 1.4 Determine relevant regulatory requirements 1.5 Inspect site and equipment to confirm or determine suitability, availability of other services and control requirements 1.6 Produce or review fluid power management schedule, including any required installation, commissioning, modification or maintenance requirements
2. Brief team on fluid power work 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, work health and safety (WHS) and environmental sustainability requirements 2.4 Agree with team on critical control points and reporting requirements
3. Commence installation, commissioning, modification or maintenance tasks	3.1 Supervise machine and equipment shutdowns required for task 3.2 Confirm availability of equipment components and materials for scheduled fluid power tasks 3.3 Check and determine that supply of services to work is 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 meet 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

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	cause
5. Finalise fluid power installation, commissioning, modification or maintenance tasks	5.1 Conduct final check to ensure completed work is consistent with drawings, manufacturer manuals and any regulatory requirements 5.2 Conduct test run of equipment and system 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 completion of work 6.2 Prepare and submit any required reports on installation, commissioning or modification in accordance with organisational procedures

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.

Sustainability includes:	- resources and energy - social and economic - life cycle design of product raw material, solids and hazardous waste, and production by-products - contamination of land, air and stormwater pollutants, and discharge to sewerage - climate change.
Appropriate software includes:	- computer-aided design (CAD) - circuit design and analysis - animation - simulation - modelling

	• performance analysis.
Validation techniques include:	• comparison of traditional solutions for simple design problems with software solutions to the same design problems • review of previously implemented designs which were completed using the software • use of failure modes and effects analysis (FMEA).
Fluid power system maintenance includes:	• safety and integrity of the system • adequacy and correct operations of controls • automation safety • adequacy of standard operating procedures (SOPs) for users • safe integration with mechanical and electrical equipment.
WHS requirements include:	• WHS acts, regulations and relevant standards • industry codes of practice • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements.
Standards include:	• AS/NZS 4024.1 Safety of machinery • AS/NZS ISO 31000 Risk management – Principles and guidelines • NOHSC:1010 National Standard for Plant • NOHSC:1014 National Standard for the Control of Major Hazard Facilities • AS 61508.1 Functional safety of electrical/electronic/programmable electronic safety-related systems – General requirements.
Sequence and mode control methods for multi-actuator circuit includes:	• sequential operations with or without conditional jumps • optimisation techniques • functions including: • timing • counting • stop start • cycle selection • boundary conditions • pneumatic and electrical relay cascade control • pneumatic and electrical relay step-sequenced control • PLC control • microcontrollers for special purpose machines.
Stand-alone and network control options include:	• compressor control and application control • fluid powered machine control including proportional-integral-derivative (PID) parameter control from remote host controller

	• communications bus systems and serial systems • distributed control systems (DCS) • supervisory control and data acquisition (SCADA) • computer-integrated manufacture (CIM) options.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM234032A Manage fluid power-related technologies in an enterprise.

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 MEM234032 Manage fluid power-related technologies in an organisation

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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:

- interpreting plans, specifications and other documentation to determine features and performance characteristics and requirements of fluid power systems
- advising other technicians, tradespersons and production personnel on fluid power installation, modification, commissioning, operation and maintenance on at least two occasions
- determining adequacy of standard operating procedures (SOPs) for fluid power systems and adjusting in response to requirements
- checking fluid power systems for safe operation including automation safety
- selecting and using software and validation techniques including 2D and 3D modelling
- determining situations that require other technical and professional assistance
- researching sustainability implications and current industrial design techniques
- evaluating solutions for feasibility against the installation, commissioning or modification criteria, including relevant engineering and financial calculations and analysis
- determining work health and safety (WHS), regulatory and risk management requirements
- communicating, negotiating and reviewing with stakeholders and client throughout installation, commissioning or modification project.

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:

- current options and trends in fluid power modelling and simulation software including underpinning programme techniques and software validation techniques
- sustainability considerations
- validation techniques
- fluid power-related technologies
- fluid power system maintenance
- research and investigations methods
- principles of fluid power systems

- dimensions, capacity and position of system components
- electrical and mechanical behaviours of fluid power systems and system responsiveness
- hydraulics and hydraulics components
- applications and characteristics of servo valves
- electronic controllers for proportional and servo valves
- sensors, transducers and amplifiers
- pneumatics and designing with pneumatic components
- multiple actuator control circuits
- compressed air system design
- WHS and regulatory requirements, codes of practice, standards, risk minimisation and registration requirements.
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Assessment Conditions

- Assessors must:
 - have vocational competency in managing fluid power-related technologies in an organisation 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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