



Australian Government

CPCPMS3039A Maintain mechanical services equipment

Release 1

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Modification History

Prerequisite unit changed

Changes to performance criteria, required skills and knowledge, range statement and critical aspects

Not equivalent to CPCPMS3019A.

Unit Descriptor

This unit of competency specifies the outcomes required to perform general maintenance of heating, ventilating and air conditioning systems and associated mechanical equipment (air distribution systems, hydronic systems and control systems).

Application of the Unit

Site location for work application may be either domestic or commercial and may be a new work site or an existing structure being renovated, extended, restored or maintained.

Licensing/Regulatory Information

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

Pre-Requisites

CPCPCM2043A Carry out WHS requirements

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

Elements and Performance Criteria

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|---|------------------------------|---|
| 1 | Prepare for work. | <p>1.1 Plans and specifications are obtained.</p> <p>1.2 <i>Work health and safety</i> (WHS) and <i>environmental requirements</i> maintaining mechanical services equipment are adhered to throughout the work.</p> <p>1.3 <i>Quality assurance requirements</i> are identified and adhered to according to workplace requirements.</p> <p>1.4 Tasks are planned and sequenced in conjunction with others involved in or affected by the work and <i>statutory and regulatory authorities</i>' requirements.</p> <p>1.5 <i>Tools and equipment</i>, including personal protective equipment, are selected and checked for serviceability.</p> <p>1.6 Work area is prepared to support efficient maintenance of mechanical services equipment.</p> |
| 2 | Perform routine maintenance. | <p>2.1 Maintenance tasks detailed in <i>routine maintenance</i> schedule are carried out to specification and in line with relevant <i>information</i>.</p> <p>2.2 Mechanical equipment and system components are checked with appropriate instruments.</p> <p>2.3 Faulty items or components are identified, <i>faults reported</i> and maintenance procedure selected.</p> |

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| 3 | Repair and replace faulty components and test job. | 3.1 | Equipment is safely isolated according to regulations and WHS requirements. |
| | | 3.2 | Faulty items or components are removed using appropriate tools, equipment and procedures. |
| | | 3.3 | Replaceable items are selected from manufacturers' catalogue or serviceable items are fitted according to manufacturer or site specifications. |
| | | 3.4 | System adjustments are made to equipment or components to comply with specifications. |
| | | 3.5 | Operational check is carried out on system to ensure its compliance with job specification. |
| | | 3.6 | Maintenance report is documented in format required by the maintenance specification. |
| | | 3.7 | Sustainability principles and concepts are applied throughout the repair, replacement and testing procedures. |
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| 4 | Clean up. | 4.1 | Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job specification. |
| | | 4.2 | Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures. |
| | | 4.3 | Documentation is completed according to workplace requirements. |

Required Skills and Knowledge

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

Required skills

- communication skills to:
 - access information
 - determine requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - follow instructions
 - report faults
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication, such as hand signals
 - literacy skills to:
 - complete workplace documentation
 - document maintenance report
 - read and interpret:
 - documentation from a variety of sources
 - maintenance schedule
 - manufacturer catalogues
 - plans, specifications and drawings
 - numeracy skills to apply measurements and calculations
 - planning and organising skills to:
 - plan and sequence tasks with others
 - plan and set out work
 - teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
 - technical skills to:
 - conduct routine maintenance on air distribution and hydronic heating, ventilating and air conditioning systems
 - identify and accurately report to appropriate personnel any faults in tools, equipment or materials
- technology skills to:
- access and understand site-specific instructions in a variety of media
 - use mobile communication technology

Required knowledge

- air-conditioning and refrigeration principles
- electrical safety principles
- effect of bacteria in water, and potential impact on health
- job safety analysis (JSA) and safe work method statements (SWMS)
- mechanical and hydraulic principles
- personal protective equipment requirements and use
- operating principles of system components used in mechanical services equipment
- processes of maintaining mechanical services equipment
- SI system of measurement
- WHS regulations relevant to the work activity
- workplace and statutory requirements for mechanical services equipment

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.

Overview of assessment

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment providing that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of:

- locating, interpreting and applying relevant information, standards and specifications to maintain mechanical services equipment
- applying safety requirements throughout the work sequence, including electrical safety requirements and the use of personal protective clothing and equipment
- for air distribution equipment, given the plans and specifications, replacing, realigning and tensioning pulleys and belts; check vibration mountings and flexible connections; lubricate bearings; clean air filters, coils and blades; and check system for leaks
- for hydronic systems, given the plans and specifications, replacing gland valves and O rings, replacing and adjusting pump glands, cleaning drains, adjusting operating control valves and settings, replacing chemical dosing systems when required and checking water system for leaks
- for both air distribution and hydronic systems, ensuring:
 - application of sustainability principles and concepts
 - correct identification of requirements and details of proposed maintenance
 - correct selection and use of appropriate processes, tools and equipment
 - completing all work to specification
 - compliance with regulations, standards and organisational quality procedures and processes
 - communicating and working effectively and

safely with others.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the minimum task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry-related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and

environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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.

Work health and safety is to be according to commonwealth, state and territory legislation and regulations and may include:

- handling of materials
- hazard control
- personal protective clothing and equipment prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including recognising and preventing hazards associated with:
 - hazardous materials and substances

- identifying and testing for electrical hazards
- service lines
- surrounding structures and facilities
- trip hazards
- use of tools and equipment
- work site visitors and the public
- working at heights
- working in proximity to others
- use of firefighting equipment
- use of first aid equipment
- workplace environment and safety.

Environmental requirements may include:

- clean-up protection
- potential health hazards
- waste management.

Quality assurance requirements may include:

- Environment Protection Authority (EPA)
- internal company quality assurance policy and risk management strategy
- health warnings
- International Standards Organisation
- site safety plan
- water treatment requirements
- workplace operations and procedures.

Statutory and regulatory authorities include:

- commonwealth, state or territory, and local authorities administering applicable Acts, regulations and codes of practice.

Tools and equipment may include:

- elevated work platforms
- hand and power tools
- ladders
- scaffolds
- test equipment
- tachometer.

Routine maintenance may include:

- aligning drives
- checking vibration isolation
- cleaning filters and strainers (air and water systems)

- cleaning equipment drains
- cleaning finned coils
- lubricating bearings
- V belt tensioning.

Information may include:

- charts and hand drawings
- instructions issued by authorised organisational or external personnel
- manufacturer specifications and instructions
- material safety data sheets (MSDS)
- memos
- organisation work specifications and requirements
- plans and sketches
- program maintenance schedules, plans and specifications
- regulatory and legislative requirements, particularly those pertaining to:
 - building codes
 - WHS and environmental requirements
 - confined space entry
 - plumbing regulations
- relevant Australian standards
- safe work procedures relating to maintaining mechanical services equipment
- signage
- verbal, written and graphical instructions
- work bulletins.

Fault reporting:

- may be written or verbal
- is to be according to company's workplace procedures.

System adjustments may include:

- check of settings
- operational check of control valves
- pipe and duct system check for leaks
- volume control and fire check operation.

Sustainability principles and concepts:

- cover the current and future social, economic and environmental use of resources
- may include:

- efficient use of material
- correct handling of hazardous materials
- appropriate recycling of material
- selecting appropriate products and components to ensure minimal environmental impact.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.