



Australian Government

MEM18095 Maintain and repair cooling towers/evaporative condensers and associated equipment

Release: 1

MEM18095 Maintain and repair cooling towers/evaporative condensers and associated equipment

Modification History

Release 1. Supersedes and is equivalent to MEM18095A Maintain and repair cooling towers/evaporative condensers and associated equipment

Application

This unit of competency defines the skills and knowledge required to perform maintenance procedures and/or repairs on cooling towers or evaporative condensers, associated equipment and controls to ensure performance to relevant Australian Standards, regulations and codes.

Cooling towers and evaporative condensers form an integral part of the refrigeration system in commercial, industrial and air conditioning fields. The towers, condensers, centrifugal water pumps, fans, valves and controls comprise the maintenance/repair work skills relevant to this field and must be assessed in this context.

Where the refitting or repair/replacement of components involves the fabrication and installation of pipework and assemblies then unit MEM10010 Install pipework and pipework assemblies should also be selected.

Where water treatment only is required then unit MEM13007 Maintain water treatment systems for cooling towers should be selected.

Where rectification, modification involving electrical disconnection and reconnection is required unit MEM18049 Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c. should also be selected.

There is legislation, regulation and codes of practice for cooling towers in each jurisdiction. Relevant material should be referenced.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM05006	Perform brazing and/or silver soldering
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12002	Perform electrical/electronic measurement
MEM12023	Perform engineering measurements
MEM12024	Perform computations

MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18055	Dismantle, replace and assemble engineering components
MEM18086	Test, recover, evacuate and charge refrigeration systems

Plus, one or more of the following including their prerequisites:

MEM18088	Maintain and repair commercial air conditioning systems and components
MEM18094	Service and repair commercial refrigeration

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, drawings, job sheets or work instructions
2	Undertake preventive maintenance	2.1	Carry out visual inspection and testing with appropriate test equipment according to refrigeration principles, procedures and safety requirements

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	checks	2.2	Perform preventative maintenance tasks to manufacturers' specifications
3	Undertake fault-finding on cooling tower/evaporative condenser water systems components	3.1	Identify system components
		3.2	Interpret the characteristics and operation of each component
		3.3	Inspect and test the operational function of each component and assess correct operation against specifications
4	Repair/replace cooling tower/evaporative condenser components	4.1	Localise faulty components and confirm malfunction
		4.2	Remove the refrigerant safely from the system and contain in accordance with procedures and regulatory requirements, where appropriate
		4.3	Dismantle faulty components and repair to manufactures' specifications, as required
		4.4	Select replacement parts from manufacturers' catalogues
5	Return to service cooling tower/evaporative condenser components	5.1	Reassemble components and test for correct operation and assess against specification
		5.2	Charge the system safely with correct refrigerant and in accordance with procedures and regulatory requirements, where appropriate
		5.3	Verify correct operation of the equipment
		5.4	Complete maintenance records/service reports according to SOPs

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Components include one (1) or more of the following:

- fan motor
- fan blade
- pump
- pump motor
- sprays
- condenser
- valves (bypass, shut-off and temperature control valves)
- thermostat
- drift eliminators
- V belt
- water strainer

Test equipment includes one (1) or more of the following:

- sling psychrometer
- thermometer
- refrigeration gauges
- vacuum pump
- leak detector
- multimeter
- insulation resistance tester

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM18095A Maintain and repair cooling towers/evaporative condensers and associated equipment

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 MEM18095 Maintain and repair cooling towers/evaporative condensers and associated equipment

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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 on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting charts, lists, catalogues, specifications, drawings and relevant legislation with respect to maintaining and repairing cooling towers/evaporative condensers and associated equipment
- selecting and using appropriate tools, techniques and test equipment necessary to check and assess components for correct operation and conformance against specifications
- carrying out preventative maintenance according to manufacturers' specifications using refrigeration techniques/practices
- identifying and localising faulty components and confirming malfunction by inspection/testing, and making required adjustments to achieve specifications
- removing the refrigerant from the system and containing in accordance with procedures and regulatory requirements, where required
- removing/dismantling and reassembling faulty components and selecting replacement parts from manufacturers' catalogues to meet the required specifications
- undertaking calculations and numerical operations associated with maintaining and repairing cooling towers/evaporative condensers and associated equipment
- charging the system and verifying correct operation of the equipment to meet specifications, where required
- completing all maintenance records/reports in accordance with SOPs.

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:

- safe work practices and procedures and use of personal protective equipment (PPE)
- terminology of cooling towers
- psychrometrics
- measuring instruments/equipment, specifications and procedures for checking temperature/humidity/air flow
- operation of centrifugal water pumps

- terminology of centrifugal water pumps
- field testing centrifugal pumps
- operation of water valves including bypass valve either mechanical or electrical operation
- procedures for testing of fan motors and operation of controls
- tools, techniques, equipment and procedures for performing preventative maintenance on cooling towers/evaporative condensers and sequence of implementation
- procedures for safely removing the refrigerant and charging the system, including all legislative and regulatory requirements
- tools, techniques, test equipment and procedures for dismantling, repairing, reassembling and testing components
- V belts
- measuring instruments/equipment, specifications and procedures for checking component noise and vibration levels
- process to select replacement parts
- specifications, operational characteristics and process for identifying system components
- process for localising and confirming faulty components
- procedures for reporting non-conformances and completing maintenance records/service reports.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining and repairing cooling towers/evaporative condensers and associated equipment 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. This must 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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