



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM13007B Maintain water treatment systems for cooling towers**

**Release: 1**

## MEM13007B Maintain water treatment systems for cooling towers

### Modification History

Not Applicable

### Unit Descriptor

|                        |                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Unit descriptor</b> | This unit covers testing water treatment as specified by Australian Standard AS 3666 or equivalent, measuring water properties, and maintaining reticulation/treatment systems. |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Application of the Unit

|                                |                                                                                                                                                                                                                                              |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application of the unit</b> | <p>The unit applies to the maintenance activities associated with water reticulation systems and includes water testing for microbial, acidic, and/or alkaline levels of tower water.</p> <p><b>Band: A</b></p> <p><b>Unit Weight: 2</b></p> |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Licensing/Regulatory Information

Not Applicable

### Pre-Requisites

|                           |           |                |
|---------------------------|-----------|----------------|
| <b>Prerequisite units</b> |           |                |
| <b>Path 1</b>             | MEM18001C | Use hand tools |
|                           |           |                |

## Employability Skills Information

|                             |                                          |
|-----------------------------|------------------------------------------|
| <b>Employability skills</b> | 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

| ELEMENT                                                       | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Apply principles of Australian Standard 3666 or equivalent | 1.1. Causes of corrosion, scale, algae and treatment/prevention can be explained.<br>1.2. Air distribution of cooling towers can be explained.                                                                                                                                                                                         |
| 2. Assess reticulation system                                 | 2.1. Relevant water conditions are assessed against specifications using standard procedures and test equipment.<br>2.2. Condition of water circulation system is assessed and appropriate action determined.<br>2.3. Performance of regulating, filtering, conditioning/dosing and pumping systems is assessed against specification. |
| 3. Measure relevant water properties                          | 3.1. Test equipment is correctly used and applied.<br>3.2. Water properties are accurately determined/recorded.                                                                                                                                                                                                                        |
| 4. Maintain reticulation/treatment systems                    | 4.1. Water temperature control system is recorded and non-compliances are reported.<br>4.2. Dosing is adjusted to specification.<br>4.3. Faults are reported to appropriate personnel according to standard operating procedures.                                                                                                      |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

Look for evidence that confirms skills in:

- planning and sequencing operations
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- checking and clarifying task-related information
- testing the condition of the water in the cooling tower/treatment system
- testing dosing components for correct operation/performance
- testing water properties using appropriate techniques and equipment

**REQUIRED SKILLS AND KNOWLEDGE**

- checking for conformance to specifications
- determining and recording test results
- adjusting dosing flow in the system to specification
- reporting system faults to appropriate personnel

**Required knowledge**

Look for evidence that confirms knowledge of:

- causes of corrosion, scale and algae
- methods of treating/preventing occurrence of corrosion, scale and/or algae in water cooling towers and treatment systems
- the air flow patterns of cooling towers
- the testing requirements of AS 3666 and/or other relevant regulations relating to water cooling towers
- precautions for preventing contamination of systems by legionella bacteria
- procedures for testing the condition of the water in the cooling tower
- specifications of the water condition
- variations of the test results from specification
- procedures to be followed when water condition varies from specification
- the correct operation/performance of the following system components: regulators, filters, conditioners and pumps related to treatment systems
- performance tests for treatment system components
- water properties to be tested
- procedures for testing water properties
- test equipment and techniques
- water temperature specifications
- procedures for reporting system faults
- codes and regulations relevant to maintaining water treatment systems
- hazards and controls associated with maintaining water cooling towers and treatment systems, including housekeeping
- safe work practices and procedures

## Evidence Guide

### 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

A person who demonstrates competency in this unit must be able to maintain water cooling towers and treatment systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

#### Context of and specific resources for assessment

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 an appropriate simulation 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. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with maintaining water cooling towers and treatment systems or other units requiring the exercise of the skills and knowledge covered by this unit.

#### Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

**EVIDENCE GUIDE****Guidance information for assessment****Range Statement****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.

**Relevant water conditions**

- Acidity
- Alkalinity
- Microbial
- Corrosion

**Unit Sector(s)****Unit sector****Co-requisite units**

| Co-requisite units |  |  |
|--------------------|--|--|
|                    |  |  |
|                    |  |  |

## Competency field

|                  |                                |
|------------------|--------------------------------|
| Competency field | Occupational health and safety |
|------------------|--------------------------------|