



Australian Government

Department of Education, Employment and Workplace Relations

SUGPCWS2A Operate a cooling water system

Revision Number: 1

SUGPCWS2A Operate a cooling water system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This is a Specialist unit. It covers the skills and knowledge required to operate cooling towers or spray ponds to supply treated, cool water for factory requirements.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Element	Performance criteria
1. Prepare the cooling tower/s for operation	1.1 Tower cleaning procedures are followed and cleaning records completed 1.2 Chemicals are available and delivery systems are ready for operation 1.3 Make up water supply is available and meets quality requirements 1.4 Pre-operational checks are conducted 1.5 Health and safety hazards / maintenance requirements are identified and reported to appropriate personnel according to workplace reporting procedures
2. Start and monitor cooling tower	2.1 The cooling tower system is started according to workplace procedures and manufacturer's recommendations 2.2 Plant is operated within limits of manufacturer's specifications to meet workplace requirements 2.3 Equipment is monitored to confirm operating condition and cleanliness 2.4 Water quality is monitored, tested and adjusted as required 2.5 The workplace meets housekeeping standards
3. Analyse and respond to abnormal performance	3.1 Water condition and plant operating conditions are analysed to identify causes of abnormal performance 3.2 Corrective action is taken in accordance with workplace procedures in response to Hazards, out-of-specification test results and/or abnormal plant performance 3.3 Emergency procedures are implemented as required according to workplace procedures and manufacturer's recommendations
4. Shutdown and clean the cooling water system	4.1 The cooling water system is cleaned according to workplace cleaning schedule and to meet legal requirements 4.2 The timing and sequencing of cooling water system shut down meets production requirements 4.3 Maintenance requirements are identified and reported according to workplace reporting procedure
5. Record information	5.1 Workplace information is recorded according to

Element

Performance criteria

workplace recording requirements

Required Skills and Knowledge

Not applicable.

Evidence Guide

Evidence guide

The assessment process must address all of the following items of evidence.

Ability to:

1. Access workplace information on cooling water requirements
2. Select, fit and use personal protective clothing and/or equipment
3. Confirm status of equipment, that it is clean ready for operation and services are available
4. Prepare and handle chemicals safely. This includes following correct preparation, handling and storage procedures and use of appropriate protective clothing and equipment
5. Conduct pre-start checks. This typically include checking:
 - raw water supply
 - tower condition and cleanliness
 - spray and pond condition
 - all safety guards and covers are in place and operational
 - drains are closed
 - chemicals are available
6. Liaise with other work areas to advise of users of cooling system status
7. Demonstrate set up and start up procedures in both manual and automatic modes
8. Monitor cooling water system operation. This typically includes visual inspections and conducting tests to monitor characteristics such as:
 - chemical addition rates and residuals
 - water quality
 - blow down rate
 - temperatures
 - water distribution
 - signs of fouling and corrosion
 - equipment condition including fans, sprays and pumps
 - water level and make-up flow
9. Take corrective action in response to out-of-specification results
10. Report and/or record corrective action as required
11. Demonstrate procedure to clean and shut down cooling water system
12. Demonstrate use of emergency cooling water supply system
13. Maintain workplace records including cleaning records and chemical usage
14. Maintain work area to meet housekeeping standards

May include ability to:

15. Use process control systems

Knowledge of:

16. Relevant state OHS legislation, standards and codes of practice relating to work responsibilities
17. Purpose and basic principles of evaporative cooling and water treatment in order to prevent corrosion and microbiological fouling
18. Cooling water system layout
19. The effect of make up water quality on blow down rates and fouling rates

20. The impact of variables including cooling water failure and high water temperature and plant operation
21. Purpose of chemicals used
22. Consequences of system fouling and typical causes
23. Safe work procedures including awareness of health and safety hazards related to cooling water system operation and associated control measures. Hazards typically include handling chemicals, manual handling, risks of working with warm water systems (Legionella)
24. Hierarchy of hazard control measures
25. Purpose and limitations of protective clothing and equipment
26. Methods used to render equipment safe to inspect, maintain and/or clean including lock-out, tag-out and isolation procedures
27. Water quality test procedures
28. Typical causes of water contamination and corrective action required
29. Equipment purpose and basic operating principles of cooling water system and related equipment. This includes pumps, valves, tower and fans. It may also include the dosing system
30. Operating requirements and parameters
31. Cleaning methods and procedures
32. Procedures for operating emergency cooling water system
33. Environmental issues and controls. Includes those relating to chemical and/or container disposal and any overflow of the system to waters of the state
34. Requirements to liaise/advise related work areas
35. Housekeeping standards for the work area
36. Reporting and recording systems. This includes both statutory and workplace requirements

May include knowledge of:

37. Basic operating principles of process control where relevant. This includes the relationship between control panels and systems and the physical equipment

Relationship with other standards

Pre-requisite units

There are no pre-requisite units for this competency standard.

Co-assessment of related units

Other units of competency relevant to the work role should be assessed in conjunction with this unit. This may include:

- SUGZPCI2A Operate a process control interface

Resources required for assessment

Assessment must occur in a real or simulated workplace where the assessee has access to:

- Cooling water system and related equipment
- Chemicals
- Relevant codes and standards
- Operating procedures and related advice on equipment operation
- Personal protective clothing and equipment
- Communication systems and equipment
- Housekeeping standards and procedures
- Workplace information recording systems, requirements and procedures

Assessment requirements

For information on how to assess this competency standard and who can assess, refer to the Assessment Guidelines for this Training Package.

Range Statement

Range statement

The range statement indicates the context for demonstrating competence. This statement is a guide and unless otherwise indicated, items may or may not apply as required by the work context.

- Work is carried out in accordance with company policies and procedures, manufacturer's recommendations, licensing requirements, codes of practice, legislative requirements, industrial awards and agreements and Australian Standard AS3666, parts I, II and III. Codes of practice include the Sugar Milling Operations Industry Code of Practice
- Workplace information can include Standard Operating Procedures (SOPs) and manufacturer's specifications
- Equipment may include the tower, spray ponds supply pump and return pump, chemical addition systems and blow down system. Typically a number of cooling towers would be located on site. They may be integrated or stand-alone
- Operation and monitoring of equipment and processes may require the use of control panels and systems
- Typical tests may include pH, total dissolved solids (TDS), conductivity, standard plate count (SPC), Legionella and tests specific to chemicals used
- Work may require the ability to work within a team environment
- Information systems may be equipment-based or remote from the cooling tower
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Unit Sector(s)

Not applicable.