



Australian Government

Department of Education, Employment and Workplace Relations

FDFSUG223A Operate a cooling water system

Release: 1

FDFSUG223A Operate a cooling water system

Modification History

New Unit based on *SUGPCWS2A Operate a cooling water system*.

Unit Descriptor

This unit describes the outcomes required to operate cooling towers or spray ponds to supply treated, cool water for factory requirements.

Application of the Unit

This unit has application in the sugar milling industry.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

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

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 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 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 workplace recording requirements

Required Skills and Knowledge

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

Required skills include:

Ability to:

- access workplace information on cooling water requirements
- select, fit and use personal protective clothing and/or equipment
- confirm status of equipment, that it is clean and ready for operation and services are available
- prepare and handle chemicals safely including following correct preparation, handling and storage procedures and use of appropriate protective clothing and equipment
- conduct pre-start checks including checking:
 - raw water supply
 - tower condition and cleanliness
 - spray and pond condition
 - all safety guards and covers are in place and operational
 - mechanical integrity of pumps, drives and fans
 - drains are closed
 - chemicals are available
- liaise with other work areas to advise of users of cooling system status
- demonstrate set up and start up procedures in both manual and automatic modes
- monitor cooling water system operation including 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
- take corrective action in response to out-of-specification results
- report and/or record corrective action as required
- demonstrate procedure to clean and shut down cooling water system
- demonstrate use of emergency cooling water supply system
- maintain workplace records including cleaning records and chemical usage
- maintain work area to meet housekeeping standards

Required knowledge include:

Knowledge of:

- relevant state OHS legislation, standards and codes of practice relating to work responsibilities
- purpose and basic principles of evaporative cooling and water treatment in order to prevent corrosion and microbiological fouling
- cooling water system layout
- the effect of make-up water quality on blow down rates and fouling rates
- the impact of variables including cooling water failure and high water temperature and plant operation
- purpose of chemicals used
- consequences of system fouling and typical causes
- safe work procedures including awareness of health and safety hazards related to cooling water system operation and associated control measures
- hierarchy of hazard control measures
- purpose and limitations of protective clothing and equipment
- methods used to render equipment safe to inspect, maintain and/or clean including lock-out, tag-out and isolation procedures
- water quality test procedures
- typical causes of water contamination and corrective action required
- equipment purpose and basic operating principles of cooling water system and related equipment including pumps, valves, tower and fans and dosing system
- operating requirements and parameters
- cleaning methods and procedures
- procedures for operating the emergency cooling water system
- environmental issues and controls including those relating to chemical and/or container disposal and any overflow of the system to waters of the state
- requirements to liaise/advise related work areas
- housekeeping standards for the work area
- reporting and recording systems including both statutory and workplace requirements

Evidence Guide

<p>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.</p>	
<p>Overview of assessment</p>	<p>Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Evidence of ability to:</p> <ul style="list-style-type: none"> • confirm status of equipment • demonstrate set up and start up procedures • monitor cooling water system operation • undertake visual inspections and conduct tests to monitor cooling water system operation • clean and shut down cooling water system.
<p>Context of and specific resources for assessment</p>	<p>Assessment must occur in a real or simulated workplace where the assessee has access to:</p> <ul style="list-style-type: none"> • Cooling water system and related equipment • Chemicals • Relevant codes and standard 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.
<p>Method of assessment</p>	<p>Other units of competency relevant to the work role should be assessed in conjunction with this unit. This may include:</p> <p>FDFOP2030A Operate a process control interface.</p>
<p>Guidance information for assessment</p>	<p>To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.</p>

Range Statement

<p>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.</p>	
Policies and procedures	<p>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.</p>
Codes of practice	<p>Codes of practice include the Sugar Milling Operations Industry Code of Practice.</p>
Workplace information	<p>Workplace information can include:</p> <ul style="list-style-type: none"> • Standard Operating Procedures (SOPs) • manufacturer's specifications.
Hazards	<p>Hazards typically include handling chemicals, manual handling, risks of working with warm water systems (<i>Legionella</i>).</p>
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • the tower • spray ponds • supply pump and return pump • chemical addition systems and blow down system. <p>Typically a number of cooling towers would be located on site. They may be integrated or stand-alone.</p>
Equipment operation and monitoring	<p>Operation and monitoring of equipment and processes typically requires the use of control panels and systems.</p>
Tests	<p>Typical tests may include:</p> <ul style="list-style-type: none"> • pH • total dissolved solids (TDS) • conductivity • standard plate count (SPC) • <i>Legionella</i> • tests specific to chemicals used.
Teamwork	<p>Work may require the ability to work within a team environment.</p>

Information systems	Information systems may be print or screen based.
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Unit Sector(s)

Sugar Milling.