

NWP268B Monitor, operate and report on chlorine-based disinfection systems

Unit descriptor

This unit of competency describes the outcomes required to monitor and operate chlorine disinfection systems and to report on process quality control.

Employability skills

The required outcomes described in this unit of competency contain applicable facets of employability skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged, will assist in identifying employability skill requirements.

Application of the unit

This unit supports the attainment of skills and knowledge required for operational staff with a specific responsibility for ensuring that chlorine disinfection system processes comply with organisational requirements. For staff working on chlorine disinfection systems where liquefied chlorine gas is used, the unit - NWP277A Work safely with liquefied chlorine gas, is essential.

ELEMENT

Elements describe the essential outcomes of a unit of competency.

1 Plan and prepare for work.

PERFORMANCE CRITERIA

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.

- 1.1 Work requirements are programmed according to *organisational and statutory requirements*.
- 1.2 The *equipment* required is selected and checked to meet the safety requirements of the task and site.
- 1.3 Personal protective equipment is selected, correctly fitted and used.

ELEMENT	PERFORMANCE CRITERIA
2 Monitor systems' performance.	<p>2.1 <i>Chlorine disinfection systems</i> are monitored according to agreed schedule and procedures.</p> <p>2.2 Process samples are collected and standard <i>tests</i> are conducted.</p> <p>2.3 Relevant occupational health and safety requirements are maintained and monitored.</p> <p>2.4 Process data is collected and reported according to organisational and disinfection system requirements.</p> <p>2.5 System adjustments are made, as required, to maintain the effectiveness of chlorine disinfection.</p>
3 Prepare and apply chemical dosing.	<p>3.1 <i>Chemicals</i> are used, handled and stored according to organisational and statutory requirements.</p> <p>3.2 Chemical dosing is prepared according to system specifications and organisational requirements and applied using appropriate <i>chlorine dosing equipment</i>.</p> <p>3.3 Information related to chlorine supply and usage is maintained according to statutory requirements.</p>
4 Complete documentation.	<p>4.1 Records are compiled from plant and system data to meet organisational and statutory requirements.</p> <p>4.2 Observations outside defined parameters are reported for further action.</p>

REQUIRED SKILLS AND KNOWLEDGE

This section describes the essential skills and knowledge and their level, essential for this unit.

Required skills:

- identify and respond to operational and process faults with chlorine dosing equipment problems
- produce reports and/or logs
- use safety and personal protective equipment
- follow plans, charts and instructions
- apply policies, standard operating procedures and standards
- collect and test samples

- communicate with employees and customers
- work effectively as part of a team
- use communication equipment
- give and receive instructions
- perform work-related calculations
- prepare and apply chlorine dosing
- operate computerised equipment
- identify control system faults
- identify hazards
- microbiological and chlorine residual sampling
- chlorine residual testing
- interpret material safety data sheets.

Required knowledge:

- properties and chemistry of chlorine
- pH
- microbiological water quality guidelines
- chlorine system layout
- lock out procedures for mechanical and electrical installations
- policies, standard operating procedures and legislation
- communication systems
- hazardous substances handling
- risk factors and potential hazards associated with chlorination
- work related chlorine calculations
- chlorine dosing processes
- equipment operation, capacity and limitations
- pumping and valving systems
- automatic feed rate control systems
- material safety data sheets.

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 in the performance criteria is detailed below. Add any 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.

Organisational and statutory requirements may include:

- organisational programs, procedures and instructions
- enterprise policies
- standard operating procedures
- by-laws

- environment protection legislation
- occupational health and safety legislation
- chemicals
- Australian Drinking Water Guidelines
- dangerous goods
- electrical
- lifts and cranes
- World Health Organisation standards
- licensing agreements.

Equipment may include:

- electronic monitoring and metering systems
- recording systems
- basic hand tools
- sampling and laboratory testing equipment
- computerised equipment
- on and off-road vehicles
- communication equipment
- personal protective equipment.

Disinfection systems may include:

- liquefied chlorine gas
- sodium hypochlorite
- calcium hypochlorite.

Tests may include:

- chlorine residuals
- pH.

Chemicals may include:

- liquefied chlorine gas
- sodium hypochlorite
- calcium hypochlorite
- pH correcting chemicals, such as:
 - sodium hydroxide
 - lime
 - soda ash.

Chlorine dosing equipment may include:

- vacuum gas or liquid chlorinator
- hypochlorite dosing pump
- calcium hypochlorite tablet dispenser.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the Assessment Guidelines for this Training Package.

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

The candidate should:

- demonstrate consistent performance for each element across a representative range of applications
- meet the Performance Criteria associated with each element by employing the techniques, procedures, information and resources available in the workplace from those listed in the Range Statement
- demonstrate an understanding of the underpinning knowledge and the application of skills as described under Knowledge and Skills.

The candidate should demonstrate the ability to monitor, operate and report on chlorine disinfection systems, including:

- scheduling work
- selecting and using appropriate tools and equipment, including personal protective equipment
- monitoring chlorine disinfection systems
- collecting process samples and performing standard tests
- collecting and reporting process data
- preparing and applying chlorine dosing safely
- producing reports.

Context of and specific resources for assessment

Access to the workplace and resources including:

- documentation that should normally be available in a water industry organisation
- relevant codes, standards, and government regulations.

Where applicable, physical resources should include equipment modified for people with disabilities.

Access must be provided to appropriate learning and/or assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

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
- a decision of competence should only be made when the assessor has complete confidence in the person's competence over time and in various contexts

- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence
- where assessment is for the purpose of recognition (RCC/RPL), the evidence provided will need to be authenticated and show that it represents competency demonstrated over a period of time
- assessment can be through simulated project-based activity and must include evidence relating to each of the elements in this unit.

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in a manner appropriate to the skill levels of the operator, any cultural issues that may affect responses to the questions, and reflecting the requirements of the competency and the work being performed.

Method of assessment

The following assessment methods are suggested:

- assessment in the workplace or in a simulated workplace and under the normal range of workplace conditions
- assessment should also be conducted in conjunction with aspects of technical competencies that are consistent with the work environment
- techniques for gathering evidence of competency may include:
 - observation of performance
 - written and/or oral questioning to assess knowledge and understanding
 - completion of workplace documents and reports produced as part of routine work activities
 - third party reports from experienced practitioners
 - completion of performance feedback from supervisors and colleagues.