Australian Government

Department of Education, Employment and Workplace Relations

NWP356B Monitor, operate and control ion exchange processes

Revision Number: 2

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Modification History

NWP356B Release 2: Layout adjusted. No changes to content.
NWP356B Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to monitor, operate and control ion exchange plant; and to measure and report on system performance and process quality control. The ability to identify faults, determine and apply technical adjustments and produce technical reports are essential to performance.

Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff with a specific responsibility for ensuring that ion exchange processes in treatment plants conform to organisational standards and comply with statutory requirements.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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 required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Monitor ion exchange plant performance.	1.1 Monitor test results and ***processes*** to maintain the parameters of operation. 1.2 Identify and report process faults and the operational condition of plant according to ***organisational and statutory requirements***.
2 Operate and control ion exchange processes.	2.1 Carry out ***routine plant inspections*** according to organisational and plant requirements. 2.2 Conduct and analyse process ***tests*** and determine performance against plant operational requirements. 2.3 Make integrated ***process adjustments*** to optimise system performance according to organisational and statutory requirements. 2.4 Collect interpret and record process data according to organisational and plant requirements. 2.5 Correctly select, fit and use required safety equipment, including personal protective equipment.
3 Compile process reports.	3.1 Compile ***reports*** from plant and system data to meet organisational and statutory requirements. 3.2 Report observations outside defined parameters for further action.

Required Skills and Knowledge

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

Required skills:

- solve operational problems
- produce reports and logs
- use safety and personal protective equipment
- interpret plans, charts and instructions
- interpret policies, procedures and standards
- communicate with employees and customers
- use communication equipment
- give and receive instructions
- operate computerised equipment
- identify control system faults
- perform system calculations
- collect samples and perform tests

Required knowledge:

- system layout
- system processes
- lock out procedures for mechanical and electrical installations
- policies, procedures and legislation
- relevant utilities and service bodies
- communication systems
- hazardous materials handling
- interpretation of material safety data sheets
- chemical principles of water treatment processes
- risk factors and potential hazards
- equipment operation, capacity and limitations
- pipes and fittings
- pumping and valving systems
- mechanical and electrical control systems

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 the Training Package.

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

The candidate should demonstrate the ability to monitor, operate and control ion exchange processes, including:

- monitoring test results and processes
- identifying and reporting faults
- conducting routine plant inspections
- taking samples and performing basic tests
- making basic process adjustments according to instructions
- collecting data and completing required documentation

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 only taken at the point 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.

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. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs if the candidate, accessibility of the item, and local industry and regional contexts.

Processes may include:

- pre-treatment, including:
  - screening
  - pH correction
- ion exchange, including:
  - softening
  - demineralisation
- natural organic matter and dissolved organic carbon removal

Organisational and statutory requirements may include:

- by-laws and organisational policies
- standard operating procedures
- environment protection
- occupational health and safety
- use of chemicals
- dangerous goods
- electrical
- lifts and cranes
- World Health Organisation standards
- Australian Drinking Water Guidelines
- National Water Quality Management strategy
- licensing agreements

Routine plant inspection may include:

- use of equipment, including:
  - electronic monitoring and metering systems
  - chart recording systems
  - basic hand tools
  - sampling and laboratory testing equipment
  - computerised equipment
  - personal protective equipment
- interaction and communication with other employees, other authorities and the general public
- visual observation
- implementation of reporting procedures that may also include procedures for the implementation of by-laws, organisational policies and statutory requirements

Tests may include:	• electrical conductivity • ion exchange capacity • pH • hardness • alkalinity
Process adjustments may include:	• pre-treatment optimisation • bypass flows • service and regeneration cycles • regeneration chemicals • waste disposal
Reports may include:	• chemical usage • environmental reports • plant performance data

Unit Sector(s)

Not applicable.

Competency field

Treatment.