Australian Government

Department of Education, Employment and Workplace Relations

NWP403A Investigate and plan the optimisation of potable water distribution systems

Release: 2

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Modification History

NWP403A Release 2: Layout adjusted. No changes to content.
NWP403A Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to coordinate, monitor and optimise system performance and maintenance planning in potable water distribution systems.

Application of the Unit

This unit is required by staff with a specific responsibility for ensuring that potable water systems comply with organisational and statutory requirements. This role may be performed by a single operator or one working in a team, and may include the coordination of an operational team.

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 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 Evaluate potable water distribution system performance.	1.1 Review existing distribution system performance data against relevant ***organisational and legislative requirements***. 1.2 Identify the impact of the ***distribution system*** on water quality. 1.3 Identify and coordinate any additional ***sampling*** and ***testing*** required for valid evaluation of current process performance.
2 Investigate water distribution system issues.	2.1 Review existing system fault reports and relevant water quality information. 2.2 Identify and record links between operational problems and maintenance activities. 2.3 Investigate the operational status of system components with reference to ***manufacturers' and suppliers' specifications***. 2.4 Carry out distribution system configuration investigations to identify ***potential deficiencies***.
3 Plan optimisation of potable water distribution system.	3.1 Identify ***potential hazards*** to the distribution system. 3.2 Select appropriate ***preventive measures*** 3.3 Develop and validate a system optimisation plan.

Required Skills and Knowledge

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

Required skills:

- investigate and report on operational and control system problems
- coordinate sampling and testing
- performs various calculations to provide data for the analysis and development of options and solutions
- interpret plans, charts and instructions
- operate control and communication systems
- use safety and personal protective equipment
- communicate with colleagues, consultants and suppliers
- produce optimisation reports
- interprets a range of complex and technical documents, including relevant:
  - regulatory, legislative, licensing and organisational requirements
  - industry codes and standards
  - specifications
  - organisational policies
- articulate complex ideas clearly
- analyse and evaluate reports and reference materials
- work collaboratively with relevant stakeholders
- analyse problems and recommend appropriate remedial solutions
- identify risks and hazards
- identify opportunities for improved distribution system management
- participate in the provision of appropriate information to inform workplace processes
- manage work priorities

Required knowledge:

- Australian Drinking Water Guidelines
- water quality parameters
- relevant legislation
- relevant enterprise policies
- range of appropriate measuring and testing procedures
- investigation procedures
- customer expectations and requirements
- operations and maintenance policies and procedures
- occupational health and safety and environmental legislation, Acts and procedures
- environmental management procedures
- control procedures for environmental risks and incidents
- system hydraulics
- incident management processes
- system layout

- system processes
- system operation
- water main isolation procedures
- sampling and testing procedures
- safety procedures
- lock out procedures for mechanical and electrical installations
- policies, standard operating procedures and legislation
- relevant utilities and service bodies
- communication systems
- risk management principles
- risk factors and potential hazards involved in water systems
- equipment operation, capacity and limitations of 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, 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 optimise system performance and maintenance planning in potable water distribution systems including:

- assessing distribution system performance and impacts on water quality
- investigating system faults and deficiencies and assessing the status of system components
- conducting hazard assessment and proposing prevention strategies
- producing and monitoring a potable water distribution system optimisation plan

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

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. 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.

Organisational or legislative requirements may be determined by:	• federal, state and local environmental and water quality legislation and guidelines • organisational policies • standard operating procedures • communication and reporting protocols • quality assurance standards and processes
Distribution system may include:	• pipes • hydrants • valves • backflow prevention devices • service reservoirs • chlorinators

Sampling may include:	• frequency of sampling
	• bacteriological samples
	• grab samples from:
	  • mains
	  • customer taps
	  • service reservoirs
	  • high-risk user facilities

Testing may include:	• microbiological testing • levels of manganese and iron • turbidity • colour • taste and odour • copper • pH • chlorine residuals • hardness • presence of disinfection by-products
Manufacturers' and designers' specifications may include:	• valve installation and operation • hydrant installation and operation • pipe pressure specifications • calibration and operation of inline equipment
Potential deficiencies may	• low pressure areas

include:	• dead ends • low flow areas • backflow • cross connections • uncovered or unsecured service reservoirs • leaks • loss of disinfectant residual
Potential hazards may include:	• microbiological contamination of water • waterborne disease outbreaks • metal poisoning • pressure for fire fighting appliances
Preventive measures may include:	• maintenance of disinfection residuals • maintenance of adequate system pressure • minimise hydraulic detention time • flushing, scouring and swabbing

Unit Sector(s)

Not applicable.

Competency field

Collection and distribution.