



Australian Government

Department of Education, Employment and Workplace Relations

NWP370 Perform water industry calculations

Release: 1

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Modification History

NWP370 Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to perform calculations for water industry related operations. This unit includes producing and interpreting charts and graphs.

Application of the Unit

This unit supports the attainment of skills and knowledge required for field and operational staff with specific responsibility for performing routine process calculations.

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 <i>bold italicised</i> text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

- 1 Identify and Interpret formulae for process calculations**
 - 1.1 Required calculation method is identified to suit the application, including selection of relevant *arithmetic operations* and/or formulae.
 - 1.2 *Units of measurement* are identified and used correctly.
- 2 Interpret and present graphical representations of mathematical information**
 - 2.1 Information presented in mathematical symbols, graphs and charts is correctly interpreted.
 - 2.2 Information is presented clearly using mathematical symbols, *graphs and charts*.
- 3 Perform calculations**
 - 3.1 Formulae are used correctly to perform *calculations*.
 - 3.2 Use electronic calculators or spreadsheets to perform water industry calculations.

Required Skills and Knowledge

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

Required skills:

- perform calculations using the basic arithmetic operations - addition, subtraction, multiplication and division
- use electronic calculators or spreadsheets to perform calculations
- select and use the appropriate formulae for a given application
- check calculated answer for accuracy
- estimate answers
- produce simple charts or graphs from given information or observations made
- interpret graphical information

Required knowledge:

- basic arithmetic operations
- BODMAS principle – order of operation
- metric units and conversions
- percentages
- ratio and proportions
- averages
- decimals and fractions
- rounding off and estimations
- reasons for ensuring that the units of each term are consistent with the formulae selected
- techniques for estimating approximate answers
- graphical representation of data
- procedures for drawing "lines of best fit"
- trends indicated by graphs or charts drawn including upper and lower limits

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:

- select appropriate mathematical processes for workplace tasks
- select and use appropriate electronic aids including calculators or computers
- carry out calculations
- estimate answers
- interpret graphical representations of mathematical information

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.

For consistency of assessment

Evidence must be gathered over time in a range of contexts to ensure the person can achieve the unit outcome and apply the competency in different situations or environments

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 of the candidate, accessibility of the item, and local industry and regional contexts.

- Arithmetic operations*** may include:
- addition, subtraction, multiplication and division
 - manipulation of decimals, fractions and mixed numbers
 - percentages
 - proportions and ratios

- Units of measurement*** may include:
- time - second
 - length -metre
 - mass – kilogram
 - volume – cubic metre
 - pressure - Pascal

- Calculations*** may include:
- areas and volumes
 - perimeter and circumference
 - detention time
 - flow rate
 - loading rates

- chemical dosages
 - laboratory results
- Graphs and charts* may include:
- bar and line graphs
 - multi parameter graphs
 - pie charts
 - control charts

Unit Sector(s)

Not applicable.

Competency Field

Common.