



Australian Government

Department of Education, Employment and Workplace Relations

NWP326A Conduct and report dam safety instrumentation monitoring

Revision Number: 2

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Modification History

NWP326A Release 2: Layout adjusted. Minor editorial changes to Application.

NWP326A Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to plan, implement and report on the monitoring of basic instrumentation installed in dams to provide assurance of their ongoing safety.

This unit of competency replaces NWP325B Conduct and report on dam safety inspection and basic monitoring.

Application of the Unit

This unit is required by staff with responsibility for monitoring the safety of a dam and reporting faults or trends.

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 Plan and prepare for dam safety monitoring.	1.1 Identify <i>organisational procedures and guidelines</i> for dam safety monitoring. 1.2 Identify and apply operational procedures determining the techniques, methods and equipment used for dam safety monitoring. 1.3 Schedule work activities according to workplace requirements and data collection equipment and methods.
2 Conduct dam safety monitoring.	2.1 Implement <i>dam safety monitoring procedures and practices</i> including <i>unusual events</i> according to organisational procedures. 2.2 Ensure equipment is functioning and fit for purpose. 2.3 Take and record <i>dam instrumentation</i> readings to the required level of accuracy and frequency. 2.4 Recognise and report any monitoring data that may indicate <i>faults or changes</i> outside expected range.
3 Report on dam safety monitoring.	3.1 Add newly recorded information on dam behaviour to historical monitoring information. 3.2 Prepare and submit accurate, timely, clear and concise monitoring instrumentation data to meet organisational requirements. 3.3 Report deviations outside approved limits including potential causes and make recommendations for follow up action.

Required Skills and Knowledge

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

Required skills:

- follow instructions, standard operating procedures, policies and standards for dam safety monitoring and instrumentation
- collect and process data
- read and interpret plans, drawings and charts
- record and report monitoring and safety information and interpret a range of workplace documents
- use mathematical calculations to collect and process data on dam safety
- produce dam instrumentation monitoring reports
- inspect and operate monitoring equipment and instruments
- communicate deviations and faults in equipment and data using clear and direct communication and relevant communication methods and equipment
- apply occupational safety protocols for working with dam assets and dam safety, including working in confined spaces

Required knowledge:

- principles of dam design and construction
- causes of dam failures and incidents
- impact of unusual events on dam safety
- types of instrumentation and their application
- requirements for installation of instruments and instrument failure
- purpose of monitoring and instrumentation used
- instructions for the operation of monitoring equipment
- dam safety performance indicators
- OH&S procedures related to dam monitoring and working ion confined spaces
- dam faults and changes indicated by monitoring and instrumentation
- organisational and statutory requirements related to monitoring and reporting dam safety

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 to ability to plan, implement and report on the monitoring of basic instrumentation installed in dams:

- preparing monitoring activity
- setting up relevant instrumentation
- interpreting and applying all relevant organisational and regulatory information and requirements in planning dam safety monitoring activities
- identifying dam safety monitoring sites and scheduling activities according to the required frequency of reporting
- conducting inspection and monitoring activities using standard workplace equipment and instruments
- gathering and recording data
- identifying faults, changes and failure indicators
- reporting on dam safety monitoring outcomes, with recommendations for action

Context of and specific resources for assessment

Access to the workplace and resources including:

- documentation that should normally be available in dam operation worksites
- codes, standards, and government regulations relevant to monitoring dam safety

Candidates should have access to on and off the job learning and assessment support when evidence is inadequate and competency has not yet been achieved.

Candidates' level of English language and literacy should be taken into account in designing assessment and adjustments should be recorded in assessment plans.

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
- 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 and examination 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. 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 procedures and guidelines will include:

- Australian National Committee on Large Dams (ANCOLD) guidelines
- dam monitoring templates and proformas
- relevant regulator's technical bulletins
- occupational health and safety information
- operation and maintenance information and manuals
- instrumentation records, plans and manuals
- dam safety performance indicators
- roles, responsibilities and delegations for instrumentation monitoring and action
- security and storage of data
- dam safety inspection manuals
- past inspection reports design and construction reports, surveillance reports and risk assessments
- prescribed surveillance schedules
- incident management plans
- data storage and security
- state and local government requirements
- standard operating procedures
- asset management plan

Dam safety monitoring procedures and practices include:

- monitoring details will include:
 - adequate timeframe and resources
 - visual observation
 - use of manual, electronic and/or computer equipment
 - operational preparedness checks
 - dam condition assessments
 - site security and access
 - dam safety emergency indicator reporting
 - checklists and previous monitoring reports
- sites to be monitored may include:
 - earthen walls and/ or embankments
 - concrete walls and structures
 - hydraulic structures
 - monitoring equipment

- spillways/ diversions systems
- outlet works/ intake structures
- pipes/ conduits
- abutments and foundations
- reservoir perimeter and downstream areas
- weirs
- tunnels and galleries
- drainage systems
- monitoring data will include:
 - seepage and leakage
 - pore pressures
 - stresses and strains
 - water levels
 - movements (external and internal)
 - rainfall
 - temperature

Unusual events will include:

- seismic events
- floods
- extreme inflows
- rapid draw down
- landslides and slips
- dam incidents
- sabotage / terrorist attack
- fires
- long term low storage levels

Dam instrumentation will include those used in the workplace from the range:

- seepage measurement devices
- water level recorders
- piezometers / stand pipes
- extensometers
- earth pressure cells
- cross arms
- hydrostatic settlement cells
- pendulums
- inclinometers
- strain gauges
- crack monitoring instrumentation
- joint meters
- external survey systems
- rain gauges
- thermometers

Faults and changes will include:

- stresses/strains
- pore pressures
- slumps, slips and slides
- earth pressures
- seepage and leakage
- misalignment/movement
- weather conditions

Unit Sector(s)

Not applicable.

Competency field

Dam safety.