



Australian Government

Department of Education, Employment and Workplace Relations

UEPOPS344B Conduct water conveyance and control

Release: 1

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Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals with the skills and knowledge required for the operation of storage, conveyance and control systems of hydro generation water supplies.

Application of the Unit

Application of the Unit 2)

This unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to Occupational Health and Safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

There are no pre-requisite units

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following levels. A description of what each level entails is provided in Section 2.3.1 Language, Literacy and Numeracy.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

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.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan and Prepare	<p>1.1 Occupational Health and Safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure.</p> <p>1.2 Work requirements are identified and clarified/confirmed with appropriate parties or by site inspection.</p> <p>1.3 Resources required to satisfy the work plan are identified and obtained in accordance with enterprise/site procedures.</p> <p>1.4 Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.</p> <p>1.5 Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements.</p> <p>1.6 Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.</p> <p>1.7 Where appropriate, the teams' and individuals' roles and responsibilities within the team are identified, and where required, assist in the provision of on-the-job training.</p>
2 Supply Water for Power Generation	<p>2.1 Inspections of storage and conveyance systems are scheduled and problems are reported and monitored in accordance with enterprise/site requirements.</p> <p>2.2 Water quality is monitored and recorded in accordance with enterprise/site requirements</p> <p>2.3 Flow regulating systems are monitored and</p>

ELEMENT	PERFORMANCE CRITERIA
	adjusted to meet generation needs and other user requirements in accordance with enterprise procedures.
	2.4 Flows are monitored and where appropriate diversions are determined to facilitate maintenance or emergency activities.
	2.5 Dam surveillance procedures are performed in accordance with enterprise/site requirements.
	2.6 Dam levels are maintained/monitored in accordance with system/site requirements.
	2.7 Functional tests of equipment are undertaken in accordance with manufacturers' specifications and enterprise/site requirements.
3 Implement Flood Control Procedures	3.1 Potential flood conditions are determined using data collected and reports communicated in accordance with enterprise procedures.
	3.2 Flood control procedures are implemented in accordance with enterprise procedures.
	3.3 Flood control outcomes are monitored and recorded/reported to appropriate personnel and reviewed in accordance with enterprise procedures.
4 Complete Documentation	4.1 Documentation is updated, maintained and equipment problems, movements, abnormalities and states are reported and logged in accordance with enterprise/site procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Evidence shall show that knowledge has been acquired of conducting water conveyance and controls

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

The extent of the Essential Knowledge and Associated Skills required follows:

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Evidence shall show that knowledge has been acquired for safe working practices of:

T1 Relevant environmental, occupational health and safety legislation and regulations

T2 Enterprise procedures

T3 Plant drawings and manufacturers manuals

T4 Introduction to and typical arrangements of hydro power production plant

T5 Relevant plant and equipment, its location and operating parameters

T6 Electric motor types and characteristics

T7 Pump and compressor types and characteristics

T8 Valve, damper and actuator types and characteristics

T9 Switchgear types and characteristics

T10 Electrical protection types and characteristics

T11 Electrical fundamentals

T12 Relevant state and territory regulations

T13 Headgate, tailgate, intake, penstock, tunnels and tail races, types and characteristics

T14 Dam, types and characteristics

T15 Principles of hydro electric generation

T16 Hydro turbine, types and characteristics

T17 Hydro turbine governor, types and characteristics

T18 hydro generator types and characteristics

T19 bypass and relief valves, types and characteristics

T20 transformers, types and characteristics

T21 auxiliary plant, types and characteristics

T22 System hydraulics; coordination processes

T23 System supplies layout

T24 Relevant utilities and service bodies

T25 Equipment operation, capacity and limitations

T26 Affect of weather and conditions on operation of water storage/conveyance systems

T27 Control systems.

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T1 Specific skills needed to achieve the Performance Criteria:

T2 Interpret plant drawings and manufacturers manuals

T3 Apply relevant state and territory regulations

T4 Apply enterprise recording procedures

T5 Plan and prioritise work

REQUIRED SKILLS AND KNOWLEDGE

- T6 Communicate effectively
- T7 Respond to abnormal operating conditions
- T8 Apply testing and diagnostic techniques
- T9 Manage water control systems.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitude competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment. Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered

will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit** 9.2)

Before the critical aspects of evidence are considered all pre-requisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UEP12". Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and Range Statement
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and Range Statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in 6) Essential Knowledge and Associated Skills of this unit
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated performance across a representative range of contexts from the prescribed items below:
 - Knowledge and application of relevant sections of: Occupational Health and Safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures
 - Preparation and planning of work

- Management of water supplies for hydro generation
- Implementation of flood control
- Documentation and reporting procedures.
- Dealing with an unplanned event by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of work.

In addition to the resources listed above in Context of assessment', evidence should show competency working, in limited spaces, with different types of plant and equipment as well as different structural/construction types and methods and in a variety of environments.

Method of assessment 9.4)

This unit shall be assessed by methods given in Section 1.3.00 Assessment Guidelines.

Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

**Concurrent
assessment and
relationship with
other units** **9.5)**

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.

Nil

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, relevant state and federal legislation, national standards for plant, standard operating procedures, local by-laws, environmental protection.

Appropriate personnel to consult, give or receive direction may include power plant operator/system controllers or equivalent, technical and engineering officers or equivalent, maintenance staff, other authorities, general public.

Information and documentation sources may include verbal or written communications, enterprise safety rules and operating instruction documentation, manufacturers' operating and maintenance manuals, log books, dedicated computer equipment, protection and alarm manuals.

Communications may be by means of telephone, two way radio, dedicated computer equipment, logs.

Equipment may include: lakes, dams, intakes/regulating gates spillways, intake gates, canals/flumes, tunnels, penstocks, hill top valves (HTV), tail race, riparian water, dewatering outlets, surge towers/shafts/ponds, pumping stations, discharge valves, pumping systems, on and off road vehicles.

System limitations may include weather conditions, environmental requirements, minimum operating levels, statutory requirement, community service obligations.

Functional tests may be carried out on mechanical/electrical and static devices.

Flood control procedures may include implementation of local area flood procedures, operation of dewatering outlets.

Technical and operational indicators may include remote or local indicators and recorders, computers and alarms (visible and/or audible).

Work completion details may include enterprise recording procedures (electronic or hard copy), environmental reports, personnel training reports.

Generic terms are used throughout this Training Package for vocational standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms are given in Section 2.1 Preliminary Information and Glossaries.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Operations