



Australian Government

Department of Education, Employment and Workplace Relations

UEGNSG108B Operate and monitor pipeline control systems

Release: 1

UEGNSG108B Operate and monitor pipeline control systems

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Unit covers operating and monitoring of pipeline systems (including valve systems, instrument and control systems prime movers, compression systems). This competency standard refers to Pipeline Control Systems; Prime Movers; Instrument and Control Systems; Valve Systems; Emergency Response procedures; Relevant Persons; Tools, Equipment and Testing Devices; Types of Faults and Reports.

Application of the Unit

Application of the Unit 2)

This competency standard shall apply to any basic and safe work site where Gas Industry operations occur. It could also apply, where applicable to other workplaces in the electricity supply industry (transmission and distribution and generation), the electrotechnology industry and the water industry, subject to all Occupational Health and Safety and duty of care requirements being met for the workplace.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit are not subject to licence regulation other than those directly related to Occupational Health and Safety,

License to practice**3)**

gas/electricity/water industry safety and compliance, industrial relations, environmental protection, telecommunications, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limit the age at which a person can operate certain equipment.

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:

Nil

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 scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information**Employability Skills****5)**

This unit contains Employability Skills

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 for operation	<p>1.1 Operational area is checked for hazards and the works schedule(s), including drawings, plans, requirements, established procedures and material lists are detailed, analysed if necessary by site inspection and the extent of the preparation of the work determined for planning and coordination</p> <p>1.2 Work is prioritised and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes to a quality standard and in accordance with established procedures</p> <p>1.3 Risk control measures are identified, prioritised and evaluated against the work schedule</p> <p>1.4 Relevant requirements and established procedures for the work are communicated to all persons and identified for all work sites</p> <p>1.5 OHS, environmental and sustainable energy policies and procedures related to the work are identified to ensure safe systems of work are followed</p> <p>1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and established procedures</p> <p>1.7 Resources including persons, equipment, tools and personal protective equipment required for the job are identified, scheduled, coordinated and confirmed in a safe and technical working order</p>

ELEMENT	PERFORMANCE CRITERIA
	1.8 Clients are provided with possible solutions and options within the scope, acceptable cost and requirements
	1.9 Liaison and communication issues with authorised persons, authorities, clients and land owners are resolved and activities coordinated to carry out work
	1.10 Persons participating in the work, including plant operators and contractors are fully briefed and respective responsibilities coordinated and authorised where applicable in accordance with establish procedures
	1.11 Status of the system is sought through communication with pipeline control centre in accordance with established procedures
2 Operate and monitor system	2.1 OHS policies and procedures and safe work practices are followed to eliminate or minimise incidents and hazards
	2.2 First Aid and other related work procedures are performed according to requirements and established procedures
	2.3 Lifting, climbing, working in confined spaces and aloft, use of power tools, techniques and practices are safely exercised according to requirements
	2.4 Equipment faults are identified through inspection and testing of operational equipment in accordance with a work schedule and to requirements
	2.5 Hazard warnings and safety signs are recognised and hazards assessed and OHS risks are reported to the immediate authorised persons for directions according to established procedures
	2.6 Operating conditions of equipment are monitored through gauge levels, temperatures, flow indicators in order to determine performance of equipment and system

ELEMENT	PERFORMANCE CRITERIA
2.7	Information concerning the operation of the pipeline system is monitored and conveyed to relevant persons to ensure safe and efficient operation of the pipeline system
2.8	Fault finding and troubleshooting techniques are applied to operational systems and equipment to identify any repairs or maintenance that is required according to requirements and established procedures
2.9	Essential Knowledge and Associated Skills are applied to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements
2.10	Solutions to non-routine problems are identified and actioned, according to requirements, using acquired Essential Knowledge and Associated Skills
2.11	Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client and to a community and industry standard
3 Shutdown system and equipment	<p data-bbox="549 1283 1305 1464">3.1 Work undertaken is checked against works schedule for conformance with requirements and anomalies which are reported and solutions identified in accordance with established procedures</p> <p data-bbox="549 1498 1305 1603">3.2 Accidents and injuries are reported and followed up in accordance with requirements and established procedures</p> <p data-bbox="549 1637 1198 1742">3.3 Work site is rehabilitated/cleaned up and confirmed safe and in accordance with established procedures</p> <p data-bbox="549 1776 1294 1926">3.4 Tools, equipment and any surplus resources and materials are where appropriate, cleaned, checked and returned to storage in accordance with established procedures</p> <p data-bbox="549 1960 1174 1991">3.5 Relevant work permit(s) are signed off</p>

ELEMENT**PERFORMANCE CRITERIA**

accordance with requirements

- 3.6 Works completion records, reports as installed/modified drawing(s) and documentation and information is confirmed, processed and the appropriate persons notified

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 safe working practices for operating and monitoring pipeline control systems.

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

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B

G 4.1.1 Operating and supervising in the Gas Industry

Evidence shall show an understanding of supervising and operating in a Gas Industry environment, indicated by the following:

- understanding and application of enterprise applicable standard operating procedures
- understanding and application of relevant enterprise permit to work systems
- understanding and application of alarm and communication systems
- understanding and application of relevant OHS and environmental legislative requirements including applicable emergency procedures
- demonstrate an understanding and application of planning, prioritisation and working autonomously in the Gas Industry.

G 4.1.2 Understand the effective operation of Gas Industry plant, equipment and materials

Evidence shall show an understanding of the effective operation of Gas Industry plant, equipment and materials, indicated by the following:

- understand and apply of relevant industry engineering terminology and units
- understanding of pipeline system operating parameters
- demonstrate operational knowledge of systems such as pumps, compressors, regulation, shutdown equipment, measurement systems by on-site or remote operation as applicable.
- understanding of relevant inspection and testing procedures for applicable plant and equipment
- understanding the process of commissioning and decommissioning of relevant equipment such as pipework, vessels and compressors, including on-site and remote operation as applicable.
- Understanding the characteristics of gas flows including compressed and non-compressed operations
- Understanding the characteristics, operation, capabilities and limitations of applicable tools and equipment including prime movers, compression and control systems, pipeline facilities and associated equipment
- understanding the operation of gas analysis and measuring equipment

G 4.1.3 Communicating effectively in the Gas Industry at a supervisory level

Evidence shall show an understanding of communication techniques required in supervisory roles in the Gas Industry, indicated by the following:

- communicate effectively with a variety of Gas Industry stakeholders, using strategies for dealing with difficult situations. The communication includes oral, written or electronic communications, with various stakeholders including:
 - workplace colleagues
 - workplace managers
 - relevant customers and suppliers
 - regulatory bodies
 - property/land owners (including traditional land owners) and tenants
 - emergency response organisations

G 4.1.4 Understand Gas Industry products, processes and characteristics

Evidence shall show a comprehensive understanding of Gas Industry products and characteristics, indicated by the following:

- understand the Gas Industry products and the characteristics and tolerances of the product including:
 - principles of applicable gas laws
 - gas pressure
 - gas temperature
 - compressibility
 - relative density – specific gravity
 - hydrocarbon and water dew points
 - components of applicable natural gases including LPG
 - standard gas conditions
 - combustion
 - venting and purging principles
 - Effects of temperature and pressure on infrastructure

G 4.1.5 Interpret Gas Industry drawings

Evidence shall show an ability to interpret and understand Gas Industry technical drawings, indicated by the following:

- understanding and interpreting relevant technical drawings including, but not limited to:
 - Process and Instrumentation Diagrams (PID)
 - Facility and pipeline construction and as-built drawings
 - Geographical Information System (GIS) drawings and data
 - Electrical drawings
 - Survey maps
 - Pipeline route maps and alignment sheets

Evidence Guide

EVIDENCE GUIDE

9) The Evidence Guide forms an integral part of this 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)

Longitudinal 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 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 prerequisites 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 — UEG11'. Evidence shall also comprise:

- A representative body of Performance Criteria 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
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and range
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti discrimination legislation, regulations, policies and workplace procedures
- Demonstrate performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/procedures/workplace		
Group	The minimum number of items on which skill	Item List

No	is to be demonstrated	
A	All	<p>Interpret technical drawings and symbols</p> <p>Ensure emergency response procedures are in place</p> <p>Communicate with other authorities and stakeholders</p> <p>Communicate schedules/coordinate to persons</p> <p>Ensure practical application of AS2865</p> <p>Interpret MSDSs</p> <p>Carry out job safety analysis</p> <p>Obtain work permit</p> <p>Use and interpret dial before you dig or its equivalent report</p>
B	At least 3	<p>Excavation</p> <p>Trenching</p> <p>Shoring</p> <p>Stitch bore</p> <p>Horizontal drilling</p> <p>Directional drilling</p>
C	At least 3	<p>Nylon (polymide) pipeline laying techniques</p> <p>Nylon gluing/stop off</p> <p>Horizontal drilling</p> <p>Directional drilling</p>
D	At least 5	<p>PE pipeline laying techniques</p> <p>Large diameter PE</p> <p>PE electro fusion</p>

		<p>PE butt fusion</p> <p>Saddle fusion</p> <p>Socket fusion</p> <p>PE stop off</p> <p>Compression couplings or flanges</p> <p>Connection of PE to nylon</p> <p>Practical application of AS3723 Installation and Maintenance of plastic pipe systems</p>
E	At least 4	<p>UPVC pipeline laying techniques</p> <p>UPVC solvent cemented joints</p> <p>UPVC moulded joints</p> <p>UPVC stop off</p> <p>UPVC couplings or flanges</p> <p>Connection of UPVC to steel</p> <p>Practical application of AS3723 Installation and maintenance of plastic pipe systems</p>
F	At least 2	<p>Steel pipeline coating repair</p> <p>Steel pipeline coating testing (Jeep)</p> <p>Steel, field joint coating</p>
G	At least 3	<p>Connection of PE to steel mains</p> <p>Steel mains welding</p> <p>Steel mains repair</p> <p>Sleeve application</p> <p>Clamp application</p> <p>Hot tap and stopple</p>

H	All	Isolate, vent and purge gas pipeline systems Operation of gas detector Operate service locator Where relevant, calculate nitrogen volume needed
I	At least 2	High pressure stop off 312 Bagtube Squash off jacks/squash off pliers
J	At least one occasion	Deal with an unplanned event by drawing on essential knowledge and associated 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
- Appropriate environmental regulation and work practices.
- Appropriate organisational requirements.
- Appropriate work environment, equipment and tools.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency in operating and monitoring pipeline control systems

Assessment of this competency must also be undertaken in either an actual workplace or under a simulated work environment.

Assessment must also integrate the employability skills in section 3.1 of this competency standard.

**Method of
assessment**

9.4)

This Unit shall be assessed by methods given in Volume 1, Part 3 ‘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 Associated Skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

There are no recommended concurrent assessments with this unit.

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit 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.

This Unit shall be demonstrated in relation to operating and monitoring pipeline control systems. The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section of this volume and form an integral part of the Range Statement of this unit:

Pipeline control systems

Prime movers

Instrument and control system

Valve system

Emergency responses

Relevant persons

Tools, equipment and testing devices

Types of faults

Reports

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Cross discipline.