



Australian Government

UEGNSG355A Monitor and report on cathodic protection systems

Release 1

UEGNSG355A Monitor and report on cathodic protection systems

Modification History

This unit replaces UEG11 unit UEGNSG317B Monitor and report on cathodic protection systems

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers the testing, basic fault recognition, minor maintenance and reporting of findings and cathodic protection systems faults, but does not include specialist cathodic protection activities.

It encompasses relevant legislation, code, regulations and established procedures in particular the requirements found under the latest version of Australian and New Zealand Standard AS 2885 and AS2832.

The work may be performed autonomously in remote locations for long periods of time and covers tools and equipment, maps and drawings, established procedures, PPE, first aid equipment and traffic control.

Application of the Unit

Application of the Unit 2)

This competency standard shall apply to gas transmission facilities, subject to all Workplace Health and Safety (WHS) /Occupational Health and Safety (OHS) and duty of care requirements being met for the workplace.

This unit is intended as an AQF 3 competency for new and existing workers in the gas industry. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

During Training:

Competency development activities are subject to regulations directly related to licensing, workplace health and safety/occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace:

The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

The skills and knowledge described in this unit are also subject to licence regulation directly related to Occupational Health and Safety, Gas Industry safety and compliance, industrial relations, environmental protection, telecommunications, anti-discrimination and training. Commonwealth, State/Territory or Local

Note:

Other conditions may apply under State and Territory legislative and regulatory requirements, for example:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as hazardous areas, confined spaces, working aloft, near live electrical devices, site rehabilitation.
2. Compliance may be required in various jurisdictions relating to currency in First Aid, hazardous areas, confined space, lifting and risk safety measures

Government legislation and regulations may exist that limits the age of persons who 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:

- UEGNSG005A Prepare to work in the gas industry
- UEGNSG006A Use a portable gas detectors to locate escape
- UEGNSG132A Carry out basic work activities in a gas industry work environment
- UEGNSG140A Apply environmental policies and procedures in the utilities industry
- UEGNSG134A Establish a utilities infrastructure work site
- UEGNSG141A Apply Workplace Health and Safety regulations, codes and practices in the gas industry

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 3 Writing 3 Numeracy 3

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

Employability Skills 5)

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 Prepare to monitor and report on cathodic protection systems	1.1 Work schedules, specific requirements, drawings, plans, requirements, established procedures and material and equipment are examined and the extent of preparation for the work is assessed 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 1.3 WHS/OHS and environmental risk control measures are identified, prioritised and evaluated against the work schedule 1.4 Relevant requirements and established procedures for the work are communicated to all persons and identified for all work sites 1.5 WHS/OHS, environmental and sustainable energy policies and procedures related to the work are identified to ensure safe systems of work are followed 1.6 Relevant work permits are secured to coordinate the performance of work according to

ELEMENT**PERFORMANCE CRITERIA**

requirements and established procedures

1.7 Resources including persons, equipment, tools and personal protective equipment required for the job are identified, scheduled, coordinated and confirmed in a safe working order

1.8 Liaison and communication issues with authorised persons, authorities, clients and land owners are resolved and activities coordinated to carry out work

1.9 Persons participating in the work are fully briefed and respective responsibilities coordinated and authorised where applicable in accordance with establish procedures

1.10 Site preparation, safety plan and the work schedule are confirmed in accordance with established procedures.

2 Monitor and report on cathodic protection systems

2.1 WHS/OHS and Environmental 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 are assessed and WHS/OHS risks are reported to the immediate authorised persons for directions according to established procedures

ELEMENT	PERFORMANCE CRITERIA
	2.6 Fault finding and troubleshooting techniques are applied to identify any repairs or maintenance that are required according to requirements and established procedures
	2.7 Solutions to non-routine problems are identified and actioned according to requirements
	2.8 Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures
3 Review, record and report on monitoring cathodic protection systems	3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies are reported and solutions identified in accordance with established procedures
	3.2 Incidents and injuries are reported and followed up in accordance with requirements and established procedures
	3.3 Work site is rehabilitated/cleaned up and confirmed safe and in accordance with established procedures
	3.4 Tools, equipment and any surplus resources and materials are where appropriate, cleaned, checked and returned to storage in accordance with established procedures
	3.5 Relevant work permit(s) are signed off accordance with requirements
	3.6 Work 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

7) *This describes the skills and knowledge and their level, required for this unit.*

Evidence shall show that knowledge has been acquired of safe working practices for monitoring and reporting on cathodic protection systems.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies. The extent of the required skills and knowledge is provided below. It forms an integral part of this unit.

KS01-G355A Cathodic protection systems

Evidence shall show an understanding of monitoring and report cathodic protection systems in accordance with relevant legislation, code, regulations and procedures. to an extent indicated by the following aspects:

T1. Relevant legislation, Australian Standards, codes, regulations and procedure requirements

T2. WHS/OHS safety requirements

- hazards, risk assessment and control measures
- identify environmental and safety hazards, assess risks and implement control measures
- Hazardous materials
- MSDS
- PPE

T3. Operation of Gas Transmission pipelines

- relevant industry engineering terminology and units
- gas pipeline system operating parameters
- gas pipeline systems such as pumps, compressors, regulation, shutdown equipment, measurement systems by on-site or remote operation as applicable.
- relevant inspection and testing procedures for applicable plant and equipment
- characteristics of gas flows including compressed and non-compressed operations
- characteristics, operation, capabilities and limitations of applicable tools and equipment

T4. Gas Industry products, processes and characteristics

- products, characteristics and tolerances including:
 - principles of applicable gas laws
 - gas pressure
 - gas temperature
 - compressibility
- relative density – specific gravity
- hydrocarbon and water dew points

REQUIRED SKILLS AND KNOWLEDGE

- components of applicable natural gases including LPG
- standard gas conditions
- combustion
- venting and purging principles
- effects of temperature and pressure on infrastructure

T5. Gas industry documents

- signs, symbols terminology and legends as used in gas industry procedures and documents
- gas industry standards, policies and procedures
- basic drawings and diagrams
 - 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
- topographical and geographical maps and information.
- workplace forms and reports

T6. Confined spaces

- requirements of Legislation, Regulations, Australian Standards and enterprise specific procedures for safe working in confined spaces
- what a confined space is and the entry safety requirements
- manufacturers' guidelines for the safe use of PPE used in confined spaces
- gas detectors for confined spaces entry
- breathing apparatus and rescue and recovery equipment

T7. Electrical fundamentals for the Gas Industry

- extra low voltage operation
- electrical risks associated activities within the Gas Industry
- meters and other relevant electrical equipment
- Licensed low voltage electrical work requirements

T8. Corrosion

- corrosion processes.

T9. Cathodic protection on a Gas Industry pipeline

- types and applications
- equipment and components
- operating principles and circuits diagrams
- electrical test equipment
- safety requirements, procedures and PPE

REQUIRED SKILLS AND KNOWLEDGE

- monitoring requirements, procedures and reporting
- testing requirements, procedures and reporting
- fault finding and minor repair requirements, procedures and reporting
- requirements and procedures for referring low voltage electrical work to relevant licensed persons
- requirements and procedures referring major repairs to immediate supervisor
- Relevant documentation, records and reports

Evidence Guide

EVIDENCE GUIDE

8) 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

8.1)

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 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.

EVIDENCE GUIDE

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 practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects 8.2) of evidence required to demonstrate competency in this unit

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 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
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and range
 - Demonstrate an understanding of the required knowledge and 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.
 - Monitor and report cathodic protection system in accordance with relevant legislation, code, regulations and procedures as described in 9.) Range Statement and including:

Range of tools/equipment/procedures/workplace		
Group No	The minimum number of items on which skill is to be demonstrated	Item List
A	All	• Working knowledge of relevant sections AS2885 and AS2832 • Demonstrate the practical use of communications equipment • Demonstrate use and maintenance of CP equipment

		• Demonstrate use and maintenance of measuring equipment • Complete written and verbal reports • Demonstrated knowledge of cathodic protection principles and equipment • Identify and recognise cathodic protection faults • Diagnose and perform minor maintenance of faults on cathodic protection equipment
B	All	• Interpret technical drawings and symbols • Operate gas detector • Operate pipe locator • Work using relevant OHS and environmental, cultural and heritage regulations, codes of practice, policies and procedures • Practical knowledge of the properties of product being transported • Work safely with hazardous materials and equipment • Apply safe manual handling techniques • Communicate effectively in the workplace • Negotiation skills • Apply basic planning skills • First Aid certificate level 1
C	At least one	Deal with an unplanned

	occasion	event by drawing on required knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items
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Context of and specific resources for assessment

8.3)

This unit contains Employability Skills

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 Competency Standard 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 monitoring and reporting on cathodic protection 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.

Method of assessment

8.4)

This Competency Standard 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 Competency Standard 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 required knowledge and skills described in this unit.

**Concurrent
assessment and
relationship
with other units**

8.5)

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.

UEGNSG342A Maintain pipeline easements

UEGNSG349A Carry out surveillance on gas transmission pipelines

UEGNSG309B First on-site response to gas pipeline emergencies

Range Statement

RANGE STATEMENT

9) *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 Competency Standard Unit shall be demonstrated in relation monitoring and reporting on cathodic protection 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:

- Tools and equipment
- Maps and drawings
- Established procedures and requirements
- PPE and First Aid equipment
- Traffic control

Unit Sector(s)

Gas supply industry

Competency Field

Competency Field **10)**

Transmission.