Australian Government

Department of Education, Employment and Workplace Relations

UEGNSG402A Install cathodic protection systems

Release: 1

UEGNSG402A Install cathodic protection systems

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor **1**)

This Unit covers the installing of cathodic protection (CP) to prevent corrosion in steel pipelines. The competency standard also covers the appropriate Australian standards and the location for maintaining cathodic protection system; components of the system; representation of other utilities; types of drawings and specifications; test equipment; types of cathodic protection faults.

Application of the Unit

Application of the Unit **3**)

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 **3.1**)

The skills and knowledge described in this unit are not subject to licence regulation other than those directly related to Occupational Health and Safety, gas/electricity/water industry safety and compliance, industrial relations, environmental protection,

License to practice	**3.1)**
	telecommunications, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s)	**2)**
Competencies	**2.1)**
	Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed:
	Nil

Employability Skills Information

Refer to the Evidence Guide

Elements and Performance Criteria Pre-Content

5) 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 installation of cathodic protection system	1.1 Cathodic protection system installation procedures are planned in accordance with work schedule(s), including drawings, plans, requirements and established procedures
	1.2 Relevant requirements and established procedures for the work are communicated to all persons and identified for all work sites
	1.3 OHS, environmental and sustainable energy policies and procedures related to the installation of cathodic protection systems are obtained and confirmed for the purposes of the work performed and communicated
	1.4 Data from completed surveys is analysed and work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures
	1.5 Risk control measures for identified hazards are prioritised, implemented and monitored against the work schedule
	1.6 Technical specifications and drawings are drafted from the analysed survey data and the relevant work permits are obtained to access and perform work according to requirements and established procedures
	1.7 Resources including persons, equipment, tools and personal protective equipment required for the job are identified, scheduled and obtained and confirmed in working order
	1.8 Relevant persons at worksite are confirmed to be current in First Aid and other related work procedures according to requirements
	1.9 Liaison and communication issues with authorised persons, authorities, clients and land-owners are resolved to carry out work where necessary

ELEMENT		PERFORMANCE CRITERIA	
		1.10	Site is prepared according to the work schedule and to minimise risk and damage to property, commerce and individuals in accordance with established procedures
		1.11	Persons participating in the work, including plant operators and contractors are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures
2	Install cathodic protection system	2.1	OHS policies and procedures and safe work practices are followed to eliminate or minimise incidents and hazards
		2.2	Lifting, climbing, working in confined spaces, excavations, trenches, or aloft, and use of power tools, techniques and practices are safely followed and currency according to requirements confirmed
		2.3	Essential Knowledge and Associated Skills for the installation of cathodic protection systems are applied to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements
		2.4	Approved specifications and drawings are reviewed and the performing of the installation of cathodic protection systems is carried out in accordance with the work schedule and to established procedures
		2.5	Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures
		2.6	Unplanned events in the installation of cathodic protection systems is undertaken with the scope of established procedures
		2.7	Known solutions to a variety of problems are applied using Essential Knowledge and Associated Skills
		2.8	Ongoing checks of quality of the work are

ELEMENT		PERFORMANCE CRITERIA	
			undertaken in accordance with given instructions and established procedures
3	Test and commission CP System	3.1	Commissioning of the installed CP system and components is conducted against works schedule for conformance with requirements, anomalies are reported in accordance with established procedures
		3.2	Accidents and injuries are reported in accordance with requirements and established procedures where applicable
		3.3	Work site is rehabilitated, cleaned up and made safe in accordance with given instructions and 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 and equipment is returned to service in accordance with requirements
		3.6	Cathodic protection system is tested and further survey data collected and work completion records and documentation is finalised and processed and appropriate persons notified

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

6) 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 installing cathodic protection systems. The extent of the essential knowledge and associated skills (EKAS) required is given in Volume 2 - Part 2.2 EKAS. It forms an integral part of this unit.

G 3.4.1 Understanding corrosion processes

REQUIRED SKILLS AND KNOWLEDGE

G 3.4.2 Interpreting system design, planning and operation

G 3.4.3 Use and understand cathodic protection systems

G 3.4.4 Select and use appropriate tools and equipment for cathodic protection

G 3.4.5 Interpreting topographical and geographical maps and information

Evidence Guide

EVIDENCE GUIDE

8) The Evidence Guide forms an integral part of this Competency Standard Units 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 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 practiced. 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

8.2)

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 UEG06'. 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 skills enabling employment
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
  - Demonstrate performance across a representative range of contexts from the prescribed items below.

Range of tools/equipment/materials/procedures/ workplaces/other variables		
Group No	**The minimum number of items on which skill is to be demonstrated**	**Item List**
A	At least 5	Components and system: Solar powered generation systems

		240 volt power generation systems Insulation and monolithic joints Galvanic anode beds Battery banks acid and lead acid Transformer rectifiers and CPUs Lighting protection equipment CP test points Kirk cells
B	At least 4	Checks and tests on CP systems: Potential surveys On/off potential surveys Coating defect assessment surveys (DCVG method, Peason technique/method, over pipeline potential method) Loop impedance testing Anode bed testing Soil resistivity testing Interference testing

C	All	Knowledge of relevant Australian Standards or their equivalents: AS 2885 AS 2430 AS 1768 AS 1596 AS 1697 AS 2832.1 AS 3000

		AS 2239 AS 2865 AG 603
D	All	Interpret cathodic protection data system surveys and readings Implement cathodic protection tests and surveys Locate and repair faults Procedures for coating surveys Check and maintain potentials Install cathodic protection system
E	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

8.3)

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 Competency Standard Units.
- 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 installing 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 Key

Competencies.

Method of assessment

8.4)

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 Competency Standard Units 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

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.

UEGNSG102A	Carry out work activities in a utilities industry work environment
UEGNSG103A	Comply with workplace OHS procedures and practices
UEGNSG104A	Comply with environmental policies and procedures
UEGNSG105A	Establish the work site
BSBCMN302A	Organise personal work priorities and professional development
BSBFLM312A	Contribute to team effectiveness
BSBFLM303A	Contribute to effective workplace relationships
BSBCMN311A	Maintain workplace safety

Key Competencies 8.6)

Evidence that particular Key Competencies have been achieved within this Competency Standard Units is in the context of the following Performance Criteria of evidence. See Volume 2, Part 4 for an explanation of Key Competencies and levels of this Training Package.

Key Competencies	Example of Application	Performance Level
How are ideas and information communicated within this competency?	Refer to the following Performance Criteria for examples of application: 1.8; 3.2	3
How can information be collected, analysed and organised?	Refer to the following Performance Criteria for examples of application: 1.1; 1.5	2
How are activities planned and organised?	Refer to the following Performance Criteria for examples of application: 1.10; 2.6	2
How is team work used within this competency?	Refer to the following Performance Criteria for examples of application: 1.9; 1.11	1
How are mathematical ideas and techniques used?	Refer to the following Performance Criteria for examples of application:	N/A
How are problem solving skills applied?	Refer to the following Performance Criteria for examples of application: 2.6; 2.7	2
How is use of technology applied?	Refer to the following Performance Criteria for examples of application: 3.4	2

Skills Enabling Employment

8.7) Skills Enabling Employment:

Evidence that competency in this unit incorporates skills enabling employment is in the context of the following performance. See Volume 2, Part 5 for definitions and an explanation of skills enabling employment.

Skills for Employment		**Example of Application**
1	Developing and using skills within a real workplace	Refer to the following Performance Criteria for examples of application: All
2	Learning to learn in the workplace	Refer to the following Performance Criteria for examples of application: 2.6; 2.7
3	Reflecting on the outcome and process of work task	Refer to the following Performance Criteria for examples of application: 3.4; 3.6
4	Interacting and understanding of the context of the work task	Refer to the following Performance Criteria for examples of application: 1.4; 1.9; 3.6
5	Planning and organising the meaningful work task	Refer to the following Performance Criteria for examples of application: 1.4; 1.5; 1.7; 1.9
6	Performing the work task in non-routine or contingent situations	Refer to the following Performance Criteria for examples of application: 2.6

Range Statement

RANGE STATEMENT

7) 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/may be demonstrated in relation to installing 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:

Applicable Australian standards/legislation

Location for maintaining CP Systems

Components and system

Representatives in other utilities

Types of checks and tests

Test equipment

Drawings and specifications

Types of CP faults

Components and systems

Relevant documentation

Relevant authorities and other stakeholders/relevant authorities

Location for maintaining CP systems

Drawings and specifications

Unit Sector(s)

Not Applicable

Literacy and numeracy skills

Literacy and numeracy skills **2.2)**

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

Competency Field

Competency Field **4)**

Cathodic protection.