



Australian Government

Department of Education, Employment and Workplace Relations

PMASUP343B Monitor and maintain cathodic protection systems

Revision Number: 1

PMASUP343B Monitor and maintain cathodic protection systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario the operations technician conducts the maintenance and monitoring of pipeline cathodic protection (CP) systems and routine operations normally conducted on those systems. The technician is required to carry out prescribed inspections and monitoring activities as detailed in procedures and compile reports, outlining results, including identified system anomalies.
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Application of the Unit

Application of the unit	Generally the operations technician would operate independently and be expected to be capable of performing all parts of this unit, however they may be part of a team during critical inspections or maintenance operations. At all times they would be liaising and cooperating with other members of the team. The operations technician will: • monitor CP systems • retrofit components that test faulty • optimise system outputs • identify and rectify operational problems diagnose and troubleshoot problems. AS 2885 Part 3 applies as the principle reference standard for this competency. This unit has no prerequisites. However, under some circumstances electrical licences or restricted electrical licences may be required. Local regulations need to be checked for details.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
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Employability Skills Information

Employability skills	This unit contains employability skills.
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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 required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare and organise operational and maintenance activities	1.1. Review previous reports and check for outstanding work orders or notices 1.2. Assemble necessary equipment and plan maintenance activities 1.3. Take readings at regular intervals from CP system monitoring/test equipment and interpret collected data 1.4. Identify CP faults and notify appropriate personnel 1.5. Compile reports based on the collected data and analyse to determine system maintenance and operational adjustments to optimise system integrity.
2. Monitor and adjust electrical equipment	2.1. Monitor equipment operating parameters to ensure operation within relevant Australian Standard specifications and make adjustments as required 2.2. Operate cathodic protection equipment in accordance with the principles of cathodic protection impressed current/corrosion systems 2.3. Maintain CP system at maximum efficiency within design parameters 2.4. Monitor equipment operating parameters to determine if the correct operating conditions of the equipment are being maintained 2.5. Collect and interpret data and determine maintenance requirements 2.6. Conduct regular inspections to ensure equipment integrity is maintained and results are recorded and any system abnormalities identified 2.7. Carry out adjustments and maintenance to the equipment where abnormalities in the system have been identified.
3. Conduct CP system surveys	3.1. Interpret survey specifications to determine survey path and equipment requirement 3.2. Conduct preparation activities on CP system to enable survey to be carried out 3.3. Conduct CP surveys of the system and log and record results of the survey 3.4. Fault find and diagnose operating CP systems 3.5. Download collected survey data to allow a report to be compiled concerning survey findings.
4. Recommission the system	4.1. Recommission the system to meet system operational requirements

ELEMENT	PERFORMANCE CRITERIA
	4.2. Restore site to meet environmental and operational requirements 4.3. Compile and update records and drawings to reflect the repair/modification 4.4. Maintain incident records.
5. Analyse and utilise CP data	5.1. Analyse survey report data and findings to determine system abnormalities and maintenance required for the continued operation of the system 5.2. Liaise with appropriate personnel to repair or modify as required, areas/equipment identified for maintenance
6. Control hazards	6.1. Identify hazards in cathodic protection systems 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.
7. Respond to problems	7.1. Identify possible problems in equipment or process 7.2. Determine problems needing action 7.3. Determine possible fault causes 7.4. Rectify problem using appropriate solution within area of responsibility 7.5. Follow through items initiated until final resolution has occurred 7.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the CP system and to distinguish between causes of problems/alarm/fault indications such as:

- interference within the system
- instrument failure/wrong reading
- electrical failure
- operational problems.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- company specific work organisations and workflow
- function of cathodic protection systems and cathodic protection equipment
- CP systems, monitor and adjust related electrical power systems
- function of solar powered power generation systems
- operations of 240V power generation systems
- insulation and monolithic joints.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the CP systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and

EVIDENCE GUIDE	
	analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMASUP342B Monitor and maintain electrical systems</i> • <i>PMAOPS230B Operate, monitor and maintain pipeline facilities/equipment</i> • <i>PMASUP243B Monitor and maintain pipeline coatings</i> • <i>PMASUP236B Operate vehicles in the field.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

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. Add any 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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the CP system. For your plant/pipeline this may include: • solar powered power generation systems • 240V power generation systems • CP system interrupters • insulation and monolithic joints • galvanic anode beds • battery banks - nicad and lead acid • transformer rectifiers and CPUs • lightning protection equipment • CP test points • Kirk cells.
Types of CP problems	Types of CP problems may include: • coating damage/deterioration • interference from other systems • anode not working • incorrect current output from CPU/TR unit • equipment fault/failure.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include:

RANGE STATEMENT

	• all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. • For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		
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