



Australian Government

Department of Education, Employment and Workplace Relations

PMASUP342B Monitor and maintain electrical systems

Revision Number: 1

PMASUP342B Monitor and maintain electrical systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the skills needed to monitor and maintain electrical systems and equipment on systems used to carry products. People performing this competency may be required to possess an electrical licence from a relevant electrical licensing authority, depending on local legislative requirements
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Application of the Unit

Application of the unit	People performing this competency would typically be able to: • test, repair and recommission electrical systems and equipment used in the industry • monitor equipment operation • issue permits to allow work to be undertaken • verify equipment and system operation • prepare and analyse reports related to the equipment/systems. This competency covers a wide range of electrical equipment and systems such as voltage regulators, alternators, generators and motors, battery banks, air conditioning systems, lighting, emergency shutdown systems, low voltage power systems, solar power systems, fire systems, and control panels. This competency includes troubleshooting a range of problems which could include electrical faults, or equipment failure. Persons performing this competency would also, as part of their job role, identify and control hazards in their work area and with equipment/systems.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>MSAPMPER300C</i>	<i>Issue work permits</i>
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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. Monitor equipment operation	1.1. Monitor equipment operation according to electrical equipment operating principles and parameters 1.2. Access and interpret relevant technical drawings and schematics to determine system faults 1.3. Issue permit to work to allow work to be undertaken 1.4. Verify equipment operation/performance through test procedures to ensure correct operation and seek confirmation of identified problems from other sources 1.5. Correct operational variations through calibration and adjustment 1.6. Document operational variations.
2. Test/repair equipment	2.1. Verify equipment is operating correctly and document test results ensuring that statutory electrical testing requirements have been completed 2.2. Apply appropriate troubleshooting techniques to determine the cause of detected operational faults 2.3. Rectify operational faults through the application of relevant maintenance procedures 2.4. Isolate, remove and dispose of faulty equipment, and install new equipment 2.5. Verify installed equipment to ensure it meets required operational parameters and conditions 2.6. Record all repairs/installations to provide historical records of the condition of system equipment.
3. Recommission systems and equipment	3.1. Recommission repaired/installed equipment to on line operation in the correct sequence at the required operational parameters 3.2. Monitor or activate systems to ensure they are operating both safely and effectively 3.3. Close out permit to work and restore site/system to normal operation.
4. Compile and analyse reports	4.1. Collect information concerning deviations/repaired equipment, and put into accepted reporting format 4.2. Compile reports ensuring they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends 4.3. Utilise information or reports for short and long term planning in deviation control.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

A person undertaking this unit of competency would be expected to demonstrate the ability to:

- test, repair, recommission and monitor the operational condition of electrical systems and equipment utilised within the industry
- communicate and report the operational condition and history of electrical stems to other team members and company personnel
- coordinate own work and the work of others, including on site contractors/operators.

It is essential to be able to apply the underlying skills and knowledge contained within this competency across a range of electrical systems and equipment.

Required knowledge

Demonstrate working knowledge and application of:

- company-specific work organisations and workflow.
- test equipment typically used with electrical system repair or maintenance.
- process and plant schematic and electrical schematic diagrams
- operations and functions of electrical systems and equipment
- test and calibration methods
- test equipment typically used with electrical systems and equipment.

It is essential to be able to apply the underlying skills and knowledge contained within this competency across a range of electrical systems.

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 and role plays.

This unit of competency requires a significant body of knowledge which will 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 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.

EVIDENCE GUIDE	
	Also confirm that the person undertaking this competency has the ability to: • implement all OHS and environmental procedures relevant to this unit • apply the permit to work system within the context of this unit • interpret a range of process and system control drawings and schematics in order to undertake required or identified repairs/modifications to electrical systems. 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 relevant OPS units.
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.
Applicable Australian standards/legislation	Applicable Australian standards/legislation may include: • OHS legislation • utility codes and standards • AS 2885: Pipelines - Gas and liquid petroleum • AS 2430.1-1987: Classification of hazardous areas - Explosive gas atmospheres • AS 1768-1991: Lightning protection • AS1596-1997/Amdt 1-1999: Storage and handling of Liquefied Petroleum Gas • AS 1697-1987: Gas transmission and distribution systems (known as the SAA Gas Pipeline Code) • AS 2832.1:1998: Cathodic protection of metals - Pipes and cables • AS 3000:2000: Electrical installations (known as the Australian/New Zealand Wiring Rules) • AS 2239-1993: Galvanic (sacrificial) anodes for cathodic protection.
Electrical equipment	Electrical equipment may include: • voltage regulating equipment • battery banks, eg nicad, lead acid • solar generating equipment • alternators, generators and motors • uninterrupted power supplies (UPS) • control panels • lighting • air conditioning • power tools and electrical leads • SWER lines.
Electrical systems	Electrical systems may include: • emergency shutdown systems

RANGE STATEMENT	
	• fire systems • solar systems • utility systems • uninterrupted power supply systems • low voltage power systems • SWER line systems • communications systems.
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. Persons are required to have skills in hazard identification, assessment and application of control measures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • 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.
Test equipment	Test equipment may include: • multimeter • chart recorders • data logging equipment • amp and volt meters • watt meters • high voltage testing equipment • earth leakage test equipment • electrical inspection tags. The use and operation of personal computers, other hardware

RANGE STATEMENT

	mediums and associated software is required.
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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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