



Australian Government

Department of Education, Employment and Workplace Relations

MEM18070C Modify complex electrical circuits and systems

Release: 1

MEM18070C Modify complex electrical circuits and systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers checking circuits and systems and diagnosing faults, modifying systems as required and testing the modified system.
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Application of the Unit

Application of the unit	This unit applies to modifications to electrical circuitry in machines, material transfer systems, distribution systems, complex control panels etc. incorporating a range of circuit protective devices, relays, timers, transformers, sensors, programmable controllers etc. A system's circuit is defined as one that interconnects a number of interdependent apparatus. A system's circuit is made up of more than one interconnecting circuit controlling and processing apparatus inputs and outputs. Band: B Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM10003B	Install and test electrical wiring and circuits up to 1000 volts a.c./1500 volts d.c.
	MEM12002B	Perform electrical/electronic measurement
	MEM12004B	Perform precision electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18048B	Fault find and repair/rectify basic electrical circuits
	MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18051B	Fault find and repair/rectify complex electrical circuits

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. Determine system specifications and characteristics	1.1. Complex circuit/system function and characteristics are determined with reference to circuit diagrams, specifications, schematics and/or consultation with technical adviser. 1.2. System specifications and operational data is obtained, read and interpreted. 1.3. Findings are verified using correct and appropriate techniques, procedures, tools and test equipment. 1.4. Results are recorded and analysed to determine appropriate modification.
2. Modify circuits and systems as required	2.1. Modifications are undertaken as determined to standard operating procedures.
3. Test modification	3.1. Modifications are tested and monitored to assess suitability. 3.2. Modifications are documented in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- determining appropriate system modifications
- analysing
- facilitating multiple processes
- obtaining and interpreting relevant circuit diagrams, flow charts, specifications, schematics, engineering data sheets, etc.
- recording/reporting
- testing and monitoring electrical circuit/systems
- high level communicating
- undertaking calculations using formulae
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions,

REQUIRED SKILLS AND KNOWLEDGE

specifications, drawings, charts, lists and other reference documentation

- planning, sequencing operations
- checking and clarifying strategies

Required knowledge

Look for evidence that confirms knowledge of:

- system interrelationship and dynamics
- operation of complex electrical circuit/system
- implications of modifications to system including hazards
- operational specifications of the circuit/system
- common electrical test instruments and their application
- appropriate test equipment and its application to the testing of the modified circuit/system
- the reporting/recording requirements associated with the modification of complex electrical circuits and systems
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

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, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to modify complex electrical circuits and systems. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Context of and specific resources for assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with modifying complex electrical circuits and systems, or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE**Guidance information for assessment****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. 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) may also be included.

Complex electrical circuits and systems

Industrial control systems, automatic process machines, material transfer systems, distribution systems, complex control panels etc. incorporating a range of circuit protective devices, relays, timers, transformers, sensors etc.

System

A system's circuit is defined as one that interconnects between a number of interdependent apparatus

Test equipment

Continuity testers, ammeters, voltmeters, multimeters, tong testers, wattmeters, cathode ray oscilloscope, etc.

Documented

All modifications recorded or incorporated into drawings, schematics, etc.

Unit Sector(s)**Unit sector****Co-requisite units**

Co-requisite units		

Competency field

Competency field	Maintenance&diagnostics
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