



Australian Government

Department of Education, Employment and Workplace Relations

MEM18069B Maintain, repair instrumentation process control analysers

Release: 1

MEM18069B Maintain, repair instrumentation process control analysers

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing preventative maintenance on process control analysers; completing fault documentation; planning corrective action; repairing, replacing, overhauling, calibrating and testing; re-installing and recommissioning process control analysers.
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Application of the Unit

Application of the unit	This unit applies to the use of electrical and electronic test equipment for transmission and signal measurement, and extends to the use of liquid analysis devices for the measurement of pH, selective ions, oxygen and electrolytic conductivity. Included is the use of gas analysis devices operating on the principles of thermal conductivity, thermal reaction, combustion, paramagnetism, chemical absorption, ionisation, infra-red, ultraviolet, emission or absorption and solid electrolytic conductivity. Tasks involve the use of hygrometers, wet and dry bulb and calibration of gas cylinders and gas supply equipment, the use of chemical calibration solutions and the use of special calibration devices specific to chemical detectors. Central to the task is the interpretation of electrical and electronic circuit diagrams and the interpretation of calibration and analysis data and procedures in accordance with manufacturers' data sheets. Safety codes of practice including the identification, handling and appropriate use of high pressure gas cylinders, equipment and chemical solutions are included. Work is undertaken autonomously or in a team environment, using predetermined standards of quality, safety and workshop procedures. Tasks are performed in laboratory, workshop or on-site environments. Unit MEM05002B (Perform high reliability soldering and desoldering) must also be selected if soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered. If diagnosis and repair of electronic equipment is undertaken to component level Unit MEM18056B
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	(Diagnose and repair analog equipment and components) and/or Unit MEM18065B (Diagnose and repair digital equipment and components) should be selected. Band: B Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05001B	Perform manual soldering/desoldering - electrical/electronic components
	MEM09002B	Interpret technical drawing
	MEM12004B	Perform precision electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18054B	Fault find, test and calibrate instrumentation systems and equipment
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18057B	Maintain/service analog/digital electronic equipment
	MEM18062B	Install, maintain and calibrate instrumentation sensors, transmitters and final control

Prerequisite units		
		elements
Path 2	MEM09002B	Interpret technical drawing
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18054B	Fault find, test and calibrate instrumentation systems and equipment
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18064B	Maintain instrumentation system components

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. Perform preventative maintenance on process control analysers	1.1. Specification requirements are determined from manufacturers' manuals, maintenance schedules and other relevant documents. 1.2. Using knowledge of process control analyser characteristics and principles of operation, specification requirements are interpreted, defined and understood. 1.3. Preventative maintenance schedules are performed on process control analysers to service and maintain analysers within defined specifications. 1.4. Using appropriate electrical and electronic test equipment, techniques and procedures, specified process control analysers are diagnosed within the system or within the laboratory to determine correct operation or malfunction. 1.5. Operation of process control analysers are monitored and assessed against predetermined laboratory data and/or the fault condition is identified, localised and monitored. 1.6. Using appropriate test equipment and procedures, correct operation of analysers is tested, and/or the fault condition is identified, localised and monitored. 1.7. Correct operation is confirmed. 1.8. Faults and malfunctions are identified and confirmed.
2. Complete fault documentation	2.1. Faults and malfunctions are documented or reported according to standard operating procedures.
3. Plan corrective action	3.1. Corrective action is planned autonomously or in consultation with appropriate personnel and actioned.
4. Repair, replace, overhaul process control analysers	4.1. Process control analysers are examined or verified for repair, replacement or overhaul using correct tools/equipment and appropriate principles, techniques and procedures. 4.2. Replacement items are selected from manufacturers' parts lists or catalogues according to specifications required. 4.3. Faulty items are repaired or overhauled using correct principles, techniques, tools, equipment and procedures. 4.4. Repaired, overhauled and replacement items are

ELEMENT	PERFORMANCE CRITERIA
	prepared for refitting according to standard operating procedures. 4.5.Process control analysers are refitted using correct principles, tools, equipment and procedures. 4.6.Refitted process control analysers are prepared for testing and calibration.
5. Calibrate and test process control analysers	5.1.Process control analysers are calibrated against appropriate physical standards using correct calibration devices, equipment, techniques and procedures. 5.2.Calibrated process control analysers are tested using appropriate test equipment. 5.3.Calibration and analysis data is collected. 5.4.Calibration and analysis data is interpreted. 5.5.Calibration and analysis data is assessed in accordance with manufacturers' data sheets, codes of practice and safety procedures.
6. Re-install and recommission process control analysers	6.1.Process control analysers are put into service to specifications with due regard to process requirements, codes of practice, safety, commissioning procedures and techniques. 6.2.Service reports are completed to 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:

- obtaining and interpreting relevant data sheets, circuit diagrams, engineering drawings, instructions, manufacturers' manuals, maintenance schedules, supplier catalogues, standard workplace procedures and other reference documents
- performing scheduled/preventative maintenance on process control analysers
- determining correct function or the malfunction of process control analysers
- recording test results
- monitoring apparent faults

REQUIRED SKILLS AND KNOWLEDGE

- identifying, monitoring and localising faults in process control analysers using a structured diagnostic approach
- confirming correct action of process control analysers
- recording/reporting faults and malfunctions in process control analysers
- preparing sequential action plan to correct faults in process control analysers
- checking and marking process control analysers for replacement, repair or overhaul
- repairing and overhauling faulty items
- preparing repaired, overhauled and replacement items for fitting/refitting
- fitting/refitting process control analysers
- preparing process control analysers for testing and calibration
- calibrating process control analysers against appropriate physical standards using appropriate calibration devices, equipment and techniques
- testing calibrated process control analysers using appropriate equipment
- obtaining relevant calibration and analysis data with respect to the given process controller
- recommissioning process control analysers
- completing necessary service reports

Required knowledge

Look for evidence that confirms knowledge of:

- specifications for the process control analyser to be installed
- procedures for maintaining process control analysers
- the maintenance to be undertaken and the frequency at which process control analysers are to be maintained
- procedures for determining correct function or the malfunction of process control analysers
- test equipment and diagnostic techniques required to determine correct function or malfunction of process control analysers
- procedures for recording test results and procedures for monitoring apparent faults detected from test results
- probable causes of variations between test results and specifications
- procedures for reporting/recording faults and/or malfunctions in process control analysers
- action to be taken to return the process control analysers to specification and reasons for undertaking the proposed actions
- persons to be consulted in planning the corrective action
- sequence of actions to be taken
- procedures for marking components for repair, replacement or overhaul
- tools, equipment and techniques required to test components and reasons for marking components for repair, replacement and/or overhaul
- specifications for the component(s) to be replaced

REQUIRED SKILLS AND KNOWLEDGE

- procedures, tools, techniques and equipment required to repair/overhaul the faulty items
- preparation requirements of items to be fitted/refitted
- procedures for preparing items for fitting/refitting
- procedures for fitting/refitting process control analysers
- tools, techniques and equipment required to fit/refit process control analysers
- preparation requirements of process control analysers prior to testing and calibration
- procedures for calibrating process control analysers
- physical standards against which process control analysers are to be calibrated
- devices, equipment and techniques required to calibrate process control analysers
- equipment and procedures for testing calibrated process control analysers
- probable causes of any variations/deviations detected
- action to be taken to return the process control analyser to specification and reasons for undertaking the proposed action(s)
- procedures for recommissioning process control analysers
- the safety precautions to be taken when recommissioning process control analysers
- procedures for reporting/recording service undertaken on process control analysers and reasons for recording service undertaken
- appropriate measuring techniques, tools and equipment
- hazards/control measures associated with maintaining, repairing instrumentation process control analysers
- use and application of personal protective equipment
- safe work practices and procedures

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 maintain, repair instrumentation process control analysers. 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. Where assessment occurs off the job, i.e. the candidate is not in productive work, 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 maintaining, repairing instrumentation process control analysers, 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. 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.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics
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