



Australian Government

UEPMNT503 Diagnose and repair faults in instrumentation systems

Release: 1

UEPMNT503 Diagnose and repair faults in instrumentation systems

Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

Application

This unit involves the skills and knowledge required to diagnose and repair instrumentation systems and all ancillary equipment including, but not limited to, PC operating systems, distributive control systems, programmable logic control systems and process control systems.

An instrumentation system is a collection of instruments used to measure, monitor, and control processes. Diagnosing and repairing faults is the practice of optimising an instrumentation system through regular inspections and verification of operational efficiency.

Competency in this unit requires the ability to plan work, testing wiring systems, testing piping and tubing systems, testing instrumentation equipment, commissioning instrumental equipment and to report on all completed work tasks. Individuals will, in general, work under supervision in an electrical, electronic and/or mechanical equipment repair workshop or on site.

Power generation maintenance personnel are typically trained and authorised to receive permits to work.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Note: Workplace practice

The application of the skills and knowledge described in this unit of competency may require a licence or training permit to practice in the workplace, where work is carried out on gas and electrical installations. Additional and/or other conditions may apply under state and territory legislative and regulatory licensing requirements.

Pre-requisite Unit

UEPMNT427 Diagnose and repair faults in complex instrumentation equipment

UEPMNT357 Diagnose and repair faults in instrumentation equipment

UEENEEI001B Install and set up transducers and sensing devices

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

Competency Field

Maintenance

Unit Sector

Electricity generation

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Plan and prepare for work

2 Diagnose instrumentation

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|------------|---|
| 1.1 | Requirements including scope of work and assigned roles are identified and confirmed with appropriate personnel or by site inspection, in accordance with workplace procedures |
| 1.2 | Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations, legislative requirements, industry standards, codes of practice, manufacturers' specifications, environmental obligations and workplace procedures are reviewed in preparation for work |
| 1.3 | Resources are obtained and inspected for compliance with job specification |
| 1.4 | Relevant plans, drawings and manuals are selected and used, in accordance with workplace procedures |
| 1.5 | Correct materials and components for work are obtained and inspected, in accordance with workplace procedures, for compliance with job specification |
| 1.6 | Work is planned, sequenced and prioritised, in accordance with workplace procedures |
| 1.7 | Potential hazards are identified, and risk control measures are selected and implemented, in accordance with workplace procedures |
| 1.8 | Work area is prepared, in accordance with workplace procedures |
| 2.1 | Normal performance and function of instrumentation system is ascertained, in accordance with workplace |

system fault	procedures
	2.2 Fault indicators, appropriate technical information and diagnostic techniques are identified and used, in accordance with workplace procedures, to diagnose faults
	2.3 Faults are reproduced and monitored, if possible, in accordance with workplace procedures
3 Find instrumentation system fault	3.1 Isolations are confirmed, where appropriate, in accordance with workplace procedures
	3.2 Instrumentation system equipment, components, wires, cables, terminations and support fixings are inspected, in accordance with workplace procedures, for faults
	3.3 Diagnostic techniques are used, in accordance with workplace procedures, to determine the fault
	3.4 Components are disconnected, in accordance with workplace procedures, to enable test measurements of suspected faulty components without back feed readings occurring
	3.5 Test and measurement instruments are used, in accordance with workplace procedures, manufacturers' specifications and job requirements
4 Determine cause of instrumentation system fault	4.1 Appropriate personnel are consulted about faults, if required, in accordance with workplace procedures
	4.2 Use is made of information from fault indicators and maintenance records, in accordance with workplace procedures
	4.3 Conclusions about the nature and cause of the fault from analysis of available evidence is used, in accordance with workplace procedures
5 Repair instrumentation system fault	5.1 Isolations are confirmed, where appropriate, in accordance with workplace procedures
	5.2 Faulty, worn or damaged equipment and components are repaired, in accordance with workplace procedures
	5.3 Parts and components are replaced, as required, in accordance with workplace procedures and

manufacturers' specifications

5.4 Instrumentation system equipment and components are disconnected for testing and are reconnected, in accordance with workplace procedures, and terminations are then checked to ensure they are electrically and mechanically sound

5.5 Faults are repaired, in accordance with workplace procedures

5.6 Final inspection is performed, in accordance with workplace procedures

6 Complete work

6.1 Work is completed and appropriate personnel are notified, in accordance with workplace procedures

6.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures

6.3 Tools and equipment are cleaned, maintained and stored, in accordance with workplace procedures

6.4 Work completion details are finalised, in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEPMT503B Diagnose and repair faults in instrumentation systems.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8>

Assessment Requirements for UEPMNT503 Diagnose and repair faults in instrumentation systems

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements and symbols including:
 - emergency procedures
 - hazard identification
 - risk control measures
 - safe working practices
- communicating with personnel
- determining cause of fault
- determining permit to work requirements
- finding faults using diagnostic and fault finding techniques and procedures
- implementing regulations, industry standards, codes of practice and legislation
- interpreting manufacturers' specifications and manuals
- performing with instrument calibration techniques
- planning for diagnosis and repair of faults in instrumentation systems work
- repairing faults using repair techniques and procedures completing work and finalising details
- selecting and identifying materials
- using tools and equipment
- utilising test and measurement instruments
- verifying and identifying faults using verification techniques
- working with data analysis techniques and tools

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions and includes knowledge of:

- diagnosis and repair of instrumentation equipment

- equipment and materials
- instrument calibration techniques
- isolations
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- power generation plant and equipment, its location and operations
- power generation plant instrument systems
- repair techniques
- test and measurement instruments
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
 - emergency procedures
 - hazard identification
 - risk control measures
 - safe working practices
- workplace documentation
- workplace policies and procedures

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions. Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

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