



Australian Government

Department of Education, Employment and Workplace Relations

UEENEEI17A Calibrate, adjust and test measuring instruments

Release: 1

UEENEEI117A Calibrate, adjust and test measuring instruments

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers calibration, adjustment and testing of measuring instruments. It encompasses working safely and to standards, following calibration and adjustment procedures, applying knowledge of parameters to be measured, testing and reporting.

Application of the Unit

Application of the Unit 2)

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training. It may be used to augment previously acquired competencies.

Licensing/Regulatory Information

License to practice

3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated

License to practice**3)**

tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space and lifting and risk safety measures.

Pre-Requisites**Prerequisite Unit(s)****4)****Competencies****4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEI10 Use instrumentation drawings,
1A specification, standards and equipment
manuals

For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2

Literacy and numeracy skills**4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4 Writing 4 Numeracy 4

Employability Skills Information

Employability Skills 5)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit
 Performance Criteria describe the required performance needed to demonstrate achievement of the element.
 Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 Prepare to calibrate, adjust and test measuring instruments	1.1 OHS procedures for a given work area are identified, obtained and understood
	1.2 Established OHS risk control measures and procedures are followed in preparation for the work.
	1.3 Safety hazards that have not previously been identified are noted, and established risk control measures are implemented.
	1.4 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site
	1.5 Instrument parameters are determined by reviewing process specification and equipment manuals.
	1.6 Tools, equipment and testing devices needed for the work are obtained in accordance with

ELEMENT	PERFORMANCE CRITERIA
2 Calibrate, adjust and test measuring instruments	established procedures and checked for correct operation and safety
	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Calibration testing/measuring arrangement is connected and set up in accordance with manufacturer's instructions and certification requirements for a particular instrument.
	2.3 Factors effecting instrument error are determined and taken into account in the calibration process.
	2.4 Instrument set-point is established and error adjustments are in accordance with manufacture's and compliance specification
	2.5 Instrument is tested and adjustment made as necessary to ensure instrument meets calibration requirements.
	2.6 Established methods for dealing with unexpected situations are discussed with appropriate person or persons and documented.
	2.7 Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.8 Ongoing checks of the quality of process output are undertaken to ensure control loop is tuned as required.
2.9 Calibration is carried out efficiently without waste of materials or damage to apparatus, the surrounding environment or services and using sustainable energy principles.	
3 Completion and report calibration activities	3.1 OHS risk control work completion measures and procedures are followed.
	3.2 Work site is cleaned and made safe in accordance with established procedures.
	3.3 Calibration is documented in accordance with certification requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Evidence shall show that knowledge has been acquired of safe working practices and calibrating and testing measuring instruments.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EI11 Calibration of measuring instruments

7A

Evidence shall show an understanding of calibration of measuring instruments to an extent indicated by the following aspects:

Measurement standards applicable to scientific instruments encompassing:

- Standards philosophy and format
- How to read and apply a standard.
- Certificate standards that apply to scientific instrumentation
- Scientific instrumentation certification process

Fundamentals of calibration encompassing:

- Calibration processes
- Need for calibration
- Metrology standards
- Traceability
- Electrical measuring instruments and devices
- High order frequency references
- Counters
- Signal and function generators

Calibration techniques encompassing:

- Principles of common calibration techniques
- Purpose of Standards and calibration certification
- Minimising error during calibration -
- source and type of errors
- techniques to minimise errors during measurements
- calculating the degree of error and calibration factors

REQUIRED SKILLS AND KNOWLEDGE

- Determining the parameters to which the device will be calibrated
- Need for normal performance check.
- Purpose of calibration documentation

Evidence Guide

EVIDENCE GUIDE

9) 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 this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of the unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit 9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Calibrate and test measuring instruments as listed as

described in 8) and including:

- A Identifying instrument parameters
- B Setting up calibration arrangement in accordance with manufacturer's instructions and certification requirements for a particular instrument.
- C Determining factors effecting error
- D Calibrating instrument to measure within specified tolerance
- E Documenting calibration with certification requirements
- F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

Context of and specific resources for assessment 9.3)

This unit must be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, the conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved

industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to calibrating and testing measuring instruments.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to calibrating, adjusting and testing measuring at least one electrical/electronic and one non-electrical instrument.

The calibrated instruments measure accurately within the prescribe tolerance.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Instrumentation and Control