



Australian Government

Department of Education, Employment and Workplace Relations

MSATMREF301A Use and maintain reference standards

Revision Number: 1

MSATMREF301A Use and maintain reference standards

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to select and use appropriate reference standards of measurement in accordance with standard procedures and industry best practice. It also involves storing and transporting reference standards correctly and maintaining their integrity during all trade measurement activities.
------------------------	---

Application of the Unit

Application of the unit	<p>This unit of competency is applicable to:</p> <ul style="list-style-type: none"> • trade measurement inspectors appointed under national measurement legislation who may use reference standards of measurement for inspecting a range of pre-packaged products, trading practices or measuring instruments as part of their allocated duties • verifiers who operate under a servicing licence to install and/or repair, test and mark specific classes of trade measuring instruments. <p>Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.</p>
--------------------------------	--

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

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.
---	--

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain reference standard integrity	1.1. Identify environmental issues that may impact on reference standard integrity and implement appropriate control strategies 1.2. Store, transport and handle reference standards in accordance with organisational procedures and industry best practice 1.3. Quarantine and report damaged or compromised reference standards in accordance with organisational procedures 1.4. Plan and organise reference standard maintenance and calibration in accordance with legislative requirements and organisational procedures 1.5. Update maintenance and calibration records in accordance with organisational procedures 1.6. Ensure that personnel assisting with the activity use correct handling procedures for reference standards
2. Select appropriate reference standards	2.1. Identify the scope and expected outcomes of the planned activity 2.2. Identify and access reference standards appropriate to the activity 2.3. Evaluate reference standard limitations associated with the activity and operating environment 2.4. Validate reference standard suitability against the activity scope and expected outcomes in accordance with legislative requirements and organisational policy and procedures
3. Use reference standards	3.1. Review the expected outcomes for the activity 3.2. Access and interpret reference standard Certificates of Verification and measurement reports 3.3. Condition the reference standard as required to produce consistent and accurate measurements 3.4. Identify, interpret and apply reference standard corrections as required 3.5. Assess the results of the activity against the prescribed performance criteria 3.6. Analyse any variances from the expected outcomes to identify any isolated or systemic problems linked to the reference standard or its use
4. Maintain a safe work environment	4.1. Use established safe work practices and personal protective equipment to ensure personal safety and

ELEMENT	PERFORMANCE CRITERIA
	that of other personnel 4.2. Identify relevant local workplace, health and safety issues and implement appropriate control strategies 4.3. Handle reference standards safely in accordance with applicable legislation and organisational procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- using correct documentation to obtain information about tolerances for reference standards
- identifying suitable reference standards for the planned activity
- accessing documented operating procedures for reference standards and test equipment
- using reference standards and test equipment in accordance with specified procedures
- calibrating/maintaining reference standards and test equipment
- maintaining accuracy and currency of maintenance register for reference standards
- identifying and recording/reporting malfunction of, or damage to, reference standards or test equipment
- interpreting Certificates of Verification in relation to the use of reference standards
- using graphs and tables within Certificates of Verification
- accessing and interpreting Certificates of Verification for a range of reference standards
- using a wide range of reference standards over a wide range of environments
- using advanced communication and negotiation skills to:
 - explain the purpose of the trade measurement activity
 - access external equipment and resources to complete the activity
 - explain procedures and expected outcomes of the activity to traders and managers
- accessing, transporting, setting up, validating, using and maintaining a range of test equipment and reference standards
- identifying and evaluating environmental impacts on a wide range of reference standards
- performing calculations involving:
 - fractions, decimals, ratios, proportions and percentages
 - scientific notation, correct units and the correct number of significant figures
 - interpretation of statistical quantities, such as mean, median, mode, range, variance and standard deviation
- organising large reference standards to be dispatched ahead of visit to trader's premises
- planning routine tasks
- demonstrating professionalism and maintaining the rights of the trader at all times
- solving routine/expected problems
- working safely which may include applying basic first aid, confined space entry

REQUIRED SKILLS AND KNOWLEDGE

and working with heavy machinery

Required knowledge

- general physical principles and concepts including weight, mass, gravity, density, volume, length and area
- Australian legal units of measurement
- organisations involved in legal metrology in Australia
- hierarchy of reference standards in relation to legal metrology
- purpose of Certificates of Verification issued under the national measurement legislation
- metrological terms such as: maximum permissible errors, maximum permissible variations, traceability, uncertainty
- information in graphs and tables within Certificates
- application of different classes of reference standards used to inspect/verify trade measurement instruments
- transport/storage specifications and procedures for test/specialised equipment and reference standards
- variations from transport/storage specifications and procedures requiring appropriate approval
- maintenance and calibration procedures for reference standards used in job role
- maintenance required for test equipment when manufacturer's requirements are unavailable
- actions to be taken where legal traceability can not be confirmed
- actions to be taken if reference standards and test equipment are found to be defective
- procedures for recording and reporting faults
- maintenance requirements for reference standards and test equipment
- knowledge of the operating procedures across a range of environments such as laboratories, retail, commercial, office, manufacturing, industrial, mining, construction, medical, chemical, petroleum, farming and abattoirs
- detailed knowledge of National Test Procedures and operating procedures for equipment and reference standards used in job role including:
 - purpose of test
 - test conditions and possible environmental impacts on performance of the instrument
 - key preparation/measurement steps in test method
 - calculation steps to give results in appropriate units and precision
 - maximum permissible errors for instruments under test
- workplace, health and safety requirements relating to personnel, reference standards, measuring instruments and test equipment
- basic first aid and site safety induction if required

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>Competency must be demonstrated in the ability to perform consistently at the required standard using reference standards relevant to job role.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> • identify, access and apply relevant test procedures • select and use suitable reference standards • maintain the integrity of reference standards during their transport, storage and use • determine whether reference standards are defective • validate the suitability of reference standards for activities relevant to job role • maintain the security and confidentiality of data in accordance with organisational and regulatory requirements • report results in the required formats and expected timeframe.
Context of and specific resources for assessment	<p>This unit of competency is to be assessed in the workplace or simulated workplace environment.</p> <p>This unit of competency may be assessed with the following units:</p> <ul style="list-style-type: none"> • MSATM units dealing with the inspection or verification of trade measurement instruments and inspection of trading practices and pre-packaged products. <p>Resources may include:</p> <ul style="list-style-type: none"> • reference standards • computer and relevant software and/or organisation information management system • Certificates of Verification • relevant legislative and organisational procedures.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • questions to assess understanding of relevant procedures, trader obligations and remedial actions • review of maintenance records prepared or

EVIDENCE GUIDE	
	<p>maintained by the candidate</p> <ul style="list-style-type: none"> • feedback from supervisors and peers regarding the candidate's ability to use and maintain reference standards in accordance with legislative and organisation's procedures • observation of the candidate using and maintaining reference standards to complete trade measurement activities. <p>In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Questioning techniques should suit the language and literacy levels of the candidate.</p>
This competency in practice	<p>Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting.</p> <p>An inspector is allocated a routine inspection of a hardware store. In preparation, the inspector locates the trader's file and notes that the company sells a variety of items by measurement using scales, rulers and volume measures. Using the organisation's checklist for inspecting this type of business, he/she identifies the reference standards and documentation required for the inspection. He/she confirms that the selected reference standards are suitable for the intended purpose, are currently verified and are not damaged before stowing them safely in his/her vehicle for transport to the hardware store. On arrival, the inspector meets the site controller and initiates the inspection in accordance with the organisation's standard procedures. The inspector collects the reference standards, test equipment and documentation from the vehicle. The standards include: masses to test a weighing instrument, a volume measure to test a 5 L measure for selling kerosene, a measure of length to test packages of rope, a density bottle to determine the density of turpentine for checking packages and a thermometer to measure the temperature of the density bottle and make appropriate temperature corrections. Before using the reference standards, the inspector confirms the expected outcomes for each activity, reviews the Certificates of Verification and conditions the volume reference standards as required.</p>

EVIDENCE GUIDE

After each activity, the inspector assesses the results against the prescribed performance criteria and analyses any variances from the expected outcomes to identify any problems that may be linked to the reference standard or its use. At the end of the visit, the inspector cleans the reference standards, returns them to the vehicle and re-stows them safely to maintain their integrity. On returning to the office, the inspector books the masses into the measurement standards laboratory for calibration as their Certificate of Verification is due to expire in 22 days.

A **verifier** is contacted by a local service station to repair and verify two of their fuel dispensers that had been recently rejected for trade use by an inspector. Before proceeding to the service station, the verifier asks the trader some questions and establishes that one fuel dispenser has a flow rate of <60 L/min and another has a flow rate >60 L/min. The verifier consults the National Test Procedure for fuel dispensers and identifies that he/she needs both a 15 L and 200 L volume reference standard to complete this work. In preparation for the visit, the verifier checks whether the reference standards are suitable, they have a current Verification Certificate and are not damaged. This examination reveals that the Certificate for the 200 L reference standard he/she intends to use has expired. He/she immediately books the measure into the measurement standards laboratory for calibration and arranges for a replacement measure with a current Certificate. Before travelling to the service station, the verifier stores the reference standards in the vehicle in accordance with standard operating procedures. On arrival, the verifier takes the time to introduce him/herself to the site controller, complete a site safety induction and outline a test strategy that is both safe and will cause minimal disruption to the trader. The verifier collects the reference standards, test equipment and documentation from the vehicle. Before using the volume measures, he/she reviews their respective Certificates of Verification and notes that there are different drainage requirements for each measure. After repairing the fuel dispensers, the verifier tests the fuel dispensers in accordance with the appropriate National Test Procedure. He/she makes sure to use the volume reference standards

EVIDENCE GUIDE

in a manner that is consistent with the requirements set out in the Certificate of Verification and the organisation's procedures to maintain the integrity of the measurements. After completing the repairs and testing, the verifier cleans the reference standards and re-stows them in the vehicle.

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.

<p>Appropriate documentation</p>	<p>Where reference is made to documentation, it is expected the latest version will be used.</p> <p>Appropriate documentation may include:</p> <ul style="list-style-type: none"> • reference standard Certificates of Verification • test procedures for inspecting measuring instruments, pre-packaged products and trading practices • organisational test reports • organisational procedures e.g. company quality assurance manual • National Measurement Act • occupational health and safety (OHS) regulations, guidelines and procedures material data safety sheets • equipment manuals and warranty, supplier catalogues and handbooks
<p>Legislation</p>	<p>Legislation may include:</p> <ul style="list-style-type: none"> • national measurement legislation • applicable Commonwealth, state and territory OHS legislation
<p>National Measurement Institute policy</p>	<p>National Measurement Institute policy may include:</p> <ul style="list-style-type: none"> • storage and maintenance procedures for reference standards • bulletin • instruction • determination • policy documents
<p>National Test Procedures</p>	<p>National Test Procedures may include:</p> <ul style="list-style-type: none"> • measuring instrument test procedures • article measurement procedures

RANGE STATEMENT	
	<ul style="list-style-type: none"> • or any other test procedure prescribed by the National Measurement Institute
OHS and environmental management requirements	<p>OHS and environmental management requirements refer to:</p> <ul style="list-style-type: none"> • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or Federal legislation. These requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council and State and Territory Departments of Health
Operating environmental impacts	<p>Operating environmental impacts may include:</p> <ul style="list-style-type: none"> • vibration • wind • heat • dust • liquid being measured
Records	<p>Records may include:</p> <ul style="list-style-type: none"> • test reports • safety procedures • a history of equipment calibration and test results

Unit Sector(s)

Unit sector	Trade Measurement
--------------------	-------------------

Competency field

Competency field	
-------------------------	--

Co-requisite units

Co-requisite units		