Australian Government

MSL904001 Perform standard calibrations

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSL904001A Perform standard calibrations

Application

This unit of competency covers the ability to calibrate test and measurement equipment in accordance with standard calibration procedures and documented test methods. These procedures/methods specify all associated reference standards, materials, equipment and methods to be used and the required parameters or quantities and ranges to be tested, including the criteria for rejection or approval.

This unit of competency is applicable to laboratory and calibration technicians who carry out tests and/or calibrations using standard calibration methods in first, second and third party laboratories, and laboratories where testing and/or calibration forms part of inspection or product certification. Personnel are not permitted to deviate from explicit instructions in any manner, modify the procedure, nor substitute alternative equipment. They work under limited supervision and results of their work are interpreted and checked by the laboratory supervisor, quality inspector or designated signatory.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Calibration

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	**Prepare items for calibration**	1.1	Select the authorised calibration procedure in accordance with workplace procedures
		1.2	Identify hazards and use appropriate personal protective equipment (PPE), safety equipment and procedures

		1.3	Confirm all measuring equipment meets the laboratory's specification requirements and complies fully with the calibration procedure
		1.4	Assemble and set up specified reference standards and associated equipment prior to testing
		1.5	Verify performance of reference standards and measuring equipment prior to use and adjust or calibrate as necessary
		1.6	Identify and minimise potential sources of measurement error
2	**Perform calibration**	2.1	Perform individual tests without variance according to the documented procedure to ensure repeatability of measurement
		2.2	Confirm readings are the result of a valid measurement and record data as required (as-found or before adjustment)
		2.3	Adjust device under test to bring readings within specification and record data (as-left or after adjustment) where required
		2.4	Analyse resulting test data to detect trends or inconsistencies that would significantly affect the accuracy or validity of test results
		2.5	Seek appropriate advice when interpretation of results is outside authorised scope of approval
3	**Document results**	3.1	Estimate and document uncertainty of measurement in accordance with workplace procedures, where required
		3.2	Document compliance/non-compliance with test requirements and/or specifications
		3.3	Record the results of each test/calibration accurately, unambiguously and objectively
		3.4	Ensure confidentiality of workplace information

4	**Finalise calibration**	4.1	Prepare and issue a final report on the job/item detailing testing carried out, traceability, statement of compliance and relevant information as required
		4.2	Report any non-compliance and verify next course of action with supervisor
		4.3	Attach calibration labels, equipment stickers, quality control tags and tamper resistant seals as required in workplace procedures
		4.4	Store test equipment/measurement standards and results in accordance with workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace procedures include the current version of one or more of:

- Australian and international standards and codes covering:
  - general requirements for the competence of testing and calibration laboratories, laboratory safety, quality and environmental management
  - accuracy of measurement methods and results, expression of uncertainty (GUM), quantifying uncertainty in analytical measurement, quality assurance of measurement equipment
- national work health and safety (WHS) standards and codes of practice
- registration/licensing and/or National Association of Testing Authorities (NATA) accreditation requirements
- safety requirements for equipment, materials or products; material safety data sheets (MSDS); and incident and accident/injury reports
- standard operating procedures (SOPs), recording and reporting

procedures
- quality manuals, equipment and operating/technical manuals
- test methods and calibration procedures (validated and authorised)
- test methods and calibration procedures published by international, national or regional standards, reputable technical organisations, scientific texts or journals and equipment manufacturers
- laboratory layout, work flows and schedules

Standard calibrations

Standard calibrations include, but are not limited to, testing and/or calibrating the following equipment and reference materials using standard methods and procedures:

- test equipment, such as anemometers, balances, barometers, callipers, environmental chambers, hygrometers, manometers, masses, micrometers, pressure equipment, spectrophotometers, tape measures, rules, temperature (digital) indicating systems, thermometers, thermocouples, timing devices, vibration analysis equipment and weighing instruments
- electrical reference standards, such as air-lines, analogue meters, attenuators, bridges-manual balance, capacitors, DC voltage references, digital instruments (calibrators, DMMs, electronic transfer standards), inductors, instrument and ratio transformers, instrument transformer test sets, potentiometers, resistors, radio frequency (RF) power meters, RF thermistor mounts and thermal converters, shunts, time interval and frequency standards, transfer standards AC-DC, voltage dividers, volt ratio boxes and watt-hour references
- working standards, instruments and testing equipment, such as electromagnetic compatibility (EMC) test equipment, field strength meters, flammability test equipment, gauges/test fingers/test pins, hipot testers, impact hammers, impulse testers, instrument calibrators, network analysers, signal generators and spectrum and harmonic analysers

Hazards

Hazards include, but are not limited to, one or more of:

- electric shock
- disturbance or interruption of services
- manual handling of heavy equipment boxes
- sources of electromagnetic radiation (lasers and RF generators/transmitters)
- fluids under pressure
- heat sources, such as ovens

Safety procedures

Safety procedures include, but are not limited, to one or more of:

- ensuring access to service shut-off points
- use of PPE, such as hearing protection, gloves, safety glasses and coveralls
- handling and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer's instructions, and workplace procedures and regulations
- regular cleaning of equipment and work areas

Reference materials

Reference materials include, but are not limited to, one or more of:

- colour standards
- graded granular materials
- hardness blocks

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health, where relevant

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa