Australian Government

MSL905001 Perform non-standard calibrations

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MSL905001 Perform non-standard calibrations

Modification History

Release 1. Supersedes and is equivalent to MSL905001A Perform non-standard calibrations

Application

This unit of competency covers the ability to recognise non-conforming calibration work, research and select the most appropriate test method or calibration procedure for a given measurement request, and then conduct the calibration. It also covers the ability to modify and revise existing procedures or substitute alternative instruments and measurement standards, when necessary.

This unit of competency is applicable to calibration technicians/specialists who carry out calibrations in first, second and third party laboratories, and laboratories where testing and/or calibration forms part of inspection or product certification. They work with limited guidance and results of their work are checked by the laboratory manager, quality inspector or designated signatory.

The unit requires personnel to use a wide variety of precision measuring equipment and standards and cope with deviations from the explicit procedural instructions detailed in standard procedures and work instructions. When deviations do occur, each case must be documented, technically justified, authorised and accepted by the client.

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

MSL904001 Perform standard calibrations

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	**Select the appropriate calibration procedure**	1.1	Identify non-conforming calibration tasks and requests and analyse their significance
		1.2	Review the authorised procedure and establish whether it is appropriate for the test, as required
		1.3	Research an alternative or adapt an existing procedure to satisfy the test specification requirements, if required
		1.4	Confirm that available resources meet all the requirements of the calibration procedure
		1.5	Obtain authorisation prior to substituting equipment, changing or deviating from the specified procedure
		1.6	Document and validate any authorised changes or deviations in accordance with workplace procedures
2	**Prepare items for calibration**	2.1	Identify hazards and use the appropriate personal protective equipment (PPE), safety equipment and procedures
		2.2	Assemble and set up reference standards and associated equipment prior to testing
		2.3	Verify performance of reference standards and measuring equipment prior to use and adjust or calibrate as necessary
		2.4	Identify and minimise potential sources of measurement error
3	**Perform calibration**	3.1	Perform individual tests and document each step in the calibration procedure to ensure repeatability of measurement
		3.2	Critically analyse readings to confirm they are the result of a valid measurement and record data as required

			(as-found or before adjustment)
		3.3	Adjust device under test to bring readings within tolerance and record results (as-left or after adjustment) if required
		3.4	Analyse resulting test data to detect trends or inconsistencies that would significantly affect the accuracy or validity of test results
		3.5	Seek appropriate advice when result interpretation is outside authorised scope of approval
4	**Document results**	4.1	Document compliance/non-compliance with requirements of test and/or specifications
		4.2	Estimate and document uncertainty of measurement in accordance with workplace procedures
		4.3	Record the results of each test/calibration accurately, unambiguously and objectively
		4.4	Ensure confidentiality of workplace information
5	**Finalise calibration**	5.1	Prepare and issue a final report for the job/item detailing testing carried out, statement of compliance and all other required information
		5.2	Report any non-compliance and verify next course of action with supervisor
		5.3	Attach calibration labels, equipment stickers, quality control tags and tamper resistant seals as required in workplace procedures
		5.4	Report all changes and deviations that may have a significant influence on the test
		5.5	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, 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

Non-standard calibrations

Non-standard calibrations involve detecting and dealing with non-conforming work associated with the testing and/or calibrating of equipment, including but not limited to:

- common 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

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

Release 1. Supersedes and is equivalent to MSL905001A Perform non-standard calibrations

Links

MSA Training Package Implementation Guides - http://mskills.org.au/training-packages/info/