



Australian Government

Assessment Requirements for MSL925003 Determine measurements of uncertainty

Release: 1

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Modification History

Release	Comments
Release 1	<p>This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>.</p> <p>Supersedes and equivalent to <i>MSL925002 Analyse measurements and estimate uncertainties</i>. Prerequisite removed. Range of conditions removed. Assessment requirements amended.</p>

Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- analysed measurements and estimated uncertainties of a minimum of 3 sets of data, including:
 - using scientific notation, correct units and correct number of significant figures
 - evaluating formulae containing powers, exponents and logarithms functions
 - preparing and interpreting linear graphs
 - using statistical analysis to estimate and report measurement uncertainty in accordance with the *ISO Guide to the Expression of Uncertainty in Measurement*
 - calculating a combined standard uncertainty using root-sum-of-squares, accounting for correlations where necessary
 - gathering information about uncertainty components from calibration reports or reference material report
 - calculating sensitivity coefficients either experimentally or by partial differentiation
 - reporting results and uncertainties in the required formats.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- the steps in the measurement, test or calibration involved
- the difference between errors, corrections and uncertainties
- uncertainty in the uncertainty estimation process
- uncertainty components:
 - calibration uncertainty

- instability or drift in the calibrated instrument
- repeatability of the results
- resolution or readability of the instrument
- environmental influences, such as temperature, air pressure, humidity, vibration, electrical noise and gravity
- reference material uncertainty
- common to the use of an instrument
- factors arising from the instrument being used under different conditions to those when it was calibrated
- factors arising from using an instrument under a different operating environment or procedures (such as orientation of a transducer and immersion depth of a temperature probe)
- reproducibility of quality control data
- workplace procedures for:
 - determining the uncertainty components associated with each of the inputs and whether they are significant and for applying appropriate corrections
 - determining uncertainty components from quality control data
- manufacturer's specifications (including instrument drift specification and reference materials)
- the concept of degrees of freedom
- the characteristics of a valid measurement
- reporting requirements: the uncertainty in measurement (GUM), National Association of Testing Authorities (NATA) or other applicable reference material
- Australian and international standards, codes and guides as they relate to the job role
- legal, ethical and work health and safety (WHS) requirements specific to the work task.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - data sets and records
 - test methods and description of test set-up
 - computer and relevant software or laboratory information system
 - workplace sampling and test procedures.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>