Australian Government

MSL925003 Determine measurements of uncertainty

Release: 1

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Modification History

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

Application

This unit of competency describes the skills and knowledge to use statistical analysis to estimate and report measurement uncertainty in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (or its replacement Standard). Personnel are required to review their estimates of measurement uncertainty to assist with making decisions on the fitness for purpose of the measurements.

This unit of competency applies to laboratory personnel who work in calibration and testing facilities, process and interpret data and are required to determine uncertainties using standard methods. The rigour required in estimating uncertainty will depend on the required accuracy of the particular calibration, test or measurement.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

Nil

Competency Field

Data

Elements and Performance Criteria

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1	**Identify the measured quantity and the uncertainty components**	1.1	Specify an equation for the measurement
		1.2	List uncertainty components that are associated with each input in the equation
2	**Determine the size of each uncertainty component**	2.1	Calculate the standard deviations and standard deviation of the mean from the measurement results
		2.2	Use calibration reports, manufacturer's specifications, quality control and validation data, and experimental data to collect other available information on the uncertainty components
3	**Reduce each uncertainty component to a standard uncertainty**	3.1	Allocate an appropriate distribution for each uncertainty component
		3.2	Calculate the standard uncertainties
4	**Calculate an expanded uncertainty to the required confidence level**	4.1	Calculate the sensitivity coefficient for each uncertainty component
		4.2	Calculate a combined standard uncertainty
		4.3	Determine an appropriate coverage factor based on the degrees of freedom associated with each uncertainty component
		4.4	Calculate the expanded uncertainty
5	**Report the expanded uncertainty**	5.1	Report the result and uncertainty to an appropriate number of significant figures
		5.2	Report the confidence level and coverage factor
		5.3	Determine the appropriateness of the size of the expanded uncertainty relative to the tolerance or required accuracy of the test

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	5.4 Determine the fitness for purpose of the expanded uncertainty relative to the use of the measurement result

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.

Unit Mapping Information

Equivalent to MSL925002 Analyse measurements and estimate uncertainties, Release 1.

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