



Australian Government

MSL953002 Operate a robotic sample preparation system

Release: 1

MSL953002 Operate a robotic sample preparation system

Modification History

Release 1. Supersedes and is equivalent to MSL953002A Operate a robotic sample preparation system

Application

This unit of competency covers the ability to operate a robotic sample preparation system to ensure efficient throughput of samples without sacrificing quality or safety. Personnel are expected to seek advice from their shift supervisor when non-routine problems arise.

This unit of competency is applicable to instrument operators in the mining, construction materials testing and manufacturing industry sectors. Robotic sample preparation systems are used where there are high volumes of material and/or there is a need to minimise the operator's contact with potentially hazardous materials.

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

Sampling

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 robotic system for operation	1.1	Perform routine system checks at start of shift
		1.2	Confirm shift priorities with supervisor
		1.3	Review job requests to identify the samples, required parameters and special instructions/preparation methods for each
		1.4	Identify hazards, safety equipment and safe work procedures associated with samples, preparation

		methods and robotic system
	1.5	Check that samples are dry and free of obvious contamination
	1.6	Check that the particle size of any sample does not exceed system input size limits
	1.7	Check samples against accompanying documentation and record/report any discrepancies
2	Load samples into system	2.1 Scan sample barcodes into system 2.2 Load samples in the correct sequence when the system is ready 2.3 Use system monitor to ensure that correct worksheet is assigned to each sample
3	Monitor system and report errors	3.1 Monitor screen displays and conduct visual checks, as necessary, to ensure that system operates correctly throughout cycle 3.2 Recognise common error codes and promptly inform supervisor 3.3 Seek advice to deal with any situation beyond scope of responsibility or knowledge
4	Unload samples	4.1 Unload samples sequentially in accordance with workplace procedures 4.2 Obtain analytical portions of each sample using workplace procedures 4.3 Label and store analytical portions and excess sample material in accordance with workplace procedures 4.4 Seek advice when problems are beyond scope of responsibility or knowledge
5	Maintain a safe work	5.1 Use safe work practices and personal protective equipment (PPE) to ensure personal safety and that of

environment**others**

- 5.2 Minimise the generation of waste and environmental impacts
- 5.3 Segregate and dispose of wastes in accordance with workplace requirements
- 5.4 Clean robotic system components, care for and store equipment as required

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 requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories; laboratory safety; quality and environmental management; industrial robot systems; sampling of specific ores and particulate materials; and labelling, storage, handling and transport of hazardous materials
- national work health and safety (WHS) standards and codes of practice, national environmental protection measures, and national measurement regulations and guidelines
- specific codes, guidelines and procedures, such as National Association of Testing Authorities (NATA) accreditation requirements and principles of good laboratory practice (GLP)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; maintenance schedules; material safety data sheets (MSDS); safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures

- sampling procedures for specific samples, sites and clients (labelling, preparation, storage, transport and disposal)
- methods and procedures which may be written to meet workplace, client and/or regulatory/certifying body requirements

Materials sampled

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

- solids, such as rocks, minerals, soils, sands and stream sediments
- pulverised core and other drill samples, such as rotary air blast (RAB), reverse circulation (RC) and aircore samples
- powder concentrates
- dump samples and grab samples

Sample preparation methods

Sample preparation methods include one or more of:

- sorting, boxing and drying
- sieving
- milling
- primary crushing (e.g. 10 mm, 2 mm)
- fine pulverising (e.g. 100 micron, 75 micron)
- robotic system parameters, such as grind time, crushing time and cleaning cycles to prevent cross-contamination

Hazards

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

- dust, silica and fibrous materials
- asbestiform minerals
- naturally occurring radioactive materials (NORM)
- samples containing nickel and lead-based compounds
- noise and vibration
- crushing, entanglement and cuts associated with moving machinery
- impact injuries from contact with robot arms
- failure of pneumatic hoses
- manual handling of heavy loads, such as sample bags/containers, racks and trolleys
- heat exhaustion/stress and fatigue

Safe work procedures

Safe work practices include, but are not limited to, one or more of:

- ensuring access to service shut-off points
- recognising and observing hazard warnings and safety signs

- labelling of samples and hazardous materials
- extracting dust
- using guards for moving machinery parts
- providing noise insulation
- following established manual handling procedures
- regularly cleaning equipment and work areas
- reporting of abnormal emissions and airborne contaminants to appropriate personnel
- using PPE, such as masks, heat resistant mittens, boots, goggles, coats, ear muffs, safety boots and heat reflective clothing

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

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSL953002A Operate a robotic sample preparation system

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MSL953002 Operate a robotic sample preparation system

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- safely operating a robotic sample preparation system reliably and efficiently for at least three (3) different types of samples with different preparation requirements and subsequent analysis
- interpreting and applying workplace procedures for operating a robotic system
- accurately recording sample details in system
- recognising potential problems caused by prior sample handling and preparation
- recognising and reporting common system error codes
- maintaining sequential control of samples through all preparation stages
- recognising hazards and using safety equipment and safe work practices
- communicating problems clearly and promptly to supervisor
- minimising rework, waste and environmental impacts.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- importance of good customer relations, optimising throughput and minimising costs and rework
- procedures for sorting and receiving samples used in job role
- sample preparation methods/processes for common mineral ore samples used in job role
- characteristics of materials to be sampled
- purpose of routine downstream analytical tests conducted on samples used in job role
- procedures for preventing contamination
- procedures for ensuring traceability of samples
- function of key components and operating procedures for robotic sample preparation system
- safe work procedures and operation of safety equipment relevant to job role
- relevant hazards, work health and safety (WHS) and environment requirements.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL953001 Receive and prepare samples for testing
 - MSL943002 Participate in laboratory or field workplace safety
- Holistic assessment methods include:
 - review of entries made by the candidate in operator and robotic system logs
 - review of quality control performance and analytical results traceable to samples prepared by the candidate
 - feedback from peers, clients and/or supervisors about the candidate's ability to operate a robotic sample preparation system safely and efficiently
 - observation of the candidate using a robotic sample preparation system
 - oral or written questions to assess candidate's knowledge of robotic sample preparation procedures, common problems and their specified corrective actions.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - a robotic sample preparation system, sample preparation methods and service charges, reagents, sample containers and labels
 - sample preparation equipment, such as splitters (e.g. riffles and rotary dividers), mills (e.g. ball, ring and rod), bowls (e.g. chrome-steel, tungsten-carbide and zirconia) and tumblers, crushers (e.g. cone, jaw and roll), grinders and disc pulverisers, sieves and ovens
 - a variety of mineral ore samples
 - client requests/documentation, such as client profile, sample identification and sample receipts, required preparation methods, storage and analyses, and service charges
 - safety equipment.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competence and currency.

- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with a laboratory about performing the competency being assessed within the last twelve months.

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