



Australian Government

MSL955002 Supervise a robotic sample preparation system

Release: 1

MSL955002 Supervise a robotic sample preparation system

Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL955001 Supervise a robotic sample preparation system. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to ensure that a workplace's robotic sample preparation system operates safely and continuously to provide clients with samples that meet their specifications. This includes prioritising and planning job sequences, solving common system problems as they arise and working closely with system operators to ensure safety and achievement of production targets and quality standards. Personnel are not expected to undertake system repairs, servicing or non-routine cleaning and maintenance.

This unit of competency applies to laboratory supervisors in charge of robotic sample preparation systems in the mining industry sector. 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. Therefore, this unit of competency may also be relevant for some laboratories in the construction materials testing and manufacturing sectors.

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

MSL953004 Operate a robotic sample preparation system

Competency Field

Sampling

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|--|-----|---|
| 1 | Plan work for shift | 1.1 | Review job requests to determine nature of samples, required parameters and any specific client instructions or preparation methods for each |
| | | 1.2 | Assess hazards associated with samples and identify the need for specific safety equipment and safe work procedures |
| | | 1.3 | Determine job sequence after consideration of the dryness of samples, need for further drying or pre-treatment and client/production priorities |
| | | 1.4 | Record job sequence and confirm details with operators |
| 2 | Oversee system set-up | 2.1 | Check that data entry for samples is complete, accurate and matches accompanying documentation |
| | | 2.2 | Check that sample preparation parameters assigned to each sample are appropriate and adjust as necessary |
| | | 2.3 | Conduct pre-use system checks, make necessary system adjustments and authorise start-up |
| 3 | Monitor system performance and recover from errors and breakdowns | 3.1 | Conduct regular system checks to determine whether system outputs are consistent with normal operation |
| | | 3.2 | Conduct regular visual checks to identify signs of malfunction, equipment wear or impending system failure |
| | | 3.3 | Interpret error codes and analyse system/equipment outputs to investigate the nature of problems |
| | | 3.4 | Shut down and/or isolate faulty system components to enable safe investigation and continuation of unaffected work tasks |
| | | 3.5 | Troubleshoot causes of common system problems and take appropriate corrective actions within scope of responsibility and technical competence |

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		3.6	Seek advice when problems are beyond scope of responsibility or knowledge
		3.7	Arrange for servicing and/or repairs in response to mechanical breakdowns
		3.8	Prior to re-start, conduct pre-use checks, adjust job sequence and sample preparation parameters and re-synchronise system components as necessary
4	Maintain system safety	4.1	Provide information and training as required to operators about sample and system hazards, required safe work procedures and use of safety/personal protective equipment (PPE)
		4.2	Check that that safety equipment and required PPE is available and fit for purpose
		4.3	Conduct regular checks to ensure that operators work safely when handling hazardous samples, operating the system and performing authorised cleaning/maintenance of system components
5	Maintain system records	5.1	Check data, results and comments entered by operators for each shift into system for completeness and accuracy
		5.2	Maintain the security, integrity and traceability of samples and system documentation
		5.3	Record and report system/equipment use, errors, breakdowns, maintenance and repairs in accordance with workplace procedures
6	Contribute to system improvements	6.1	Identify and report opportunities to improve system safety to appropriate personnel
		6.2	Examine system logs and outputs to identify instances or emerging trends of sub-standard performance
		6.3	Recommend appropriate preventative/corrective actions

Elements describe the essential outcomes.

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for improving performance to relevant personnel

6.4 Implement authorised system improvements

6.5 Train operators to improve performance and minimise recurrence of preventable problems

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 MSL955001 Supervise a robotic sample preparation system, 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>

Assessment Requirements for MSL955002 Supervise a robotic sample preparation system

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Performance Evidence

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

- ensured that the robotic sample preparation system operates efficiently and safely to produce outputs that meet the workplace and/or client quality requirements for at least 3 job sequences.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- geological and chemical characteristics of mineral ores handled in job role
- typical materials sampled:
 - 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/processes for a range of mineral ore samples:
 - 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
- sample preparation equipment:

- 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
- ovens
- sample containers and labels
- purpose and key steps in routine downstream analytical tests for samples handled in job role
- workplace procedures for:
 - sorting, receiving and analysing samples
 - preventing contamination
 - ensuring security, integrity and traceability of samples
 - ensuring confidentiality of results
 - sampling for specific samples, sites and clients (labelling, preparation, storage, transport and disposal)
 - recording and reporting
- function of key components and operating procedures for robotic sample preparation system
- function of key components of laboratory information management system (LIMS), system software and layout of screens
- common hazards:
 - 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
- common system problems and corrective actions:
 - sample losses:
 - inspecting mill for mechanical problems and worn hoses
 - inspecting balance/load cell, clean and check calibration
 - checking sample for dryness and contamination
 - collision of sample buckets, transport belt problem:
 - clearing obstruction, cross-checking sample, worksheet, job sequence and synchronising belt
 - loss of air pressure:

- checking pneumatic lines, compressor and solenoid values
- laboratory information management system (LIMS) network connections:
 - checking all parameters are saved in system, if not, unloading and reloading data and cross-check samples with worksheets
- troubleshooting and problem-solving techniques relevant to job role
- importance of good customer relations, throughput, costs and minimising rework
- awareness of environmental sustainability issues as they relate to the work task
- 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:
 - a robotic sample preparation system
 - mineral ore samples, sample preparation methods, equipment and reagents
 - client requests/documentation: client profile; sample identification; required preparation methods
 - safety equipment
 - workplace procedures.

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

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