



Australian Government

Department of Education, Employment and Workplace Relations

MSS027011A Select, commission and maintain environmental monitoring instruments

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the ability to provide fully functioning environmental monitoring instruments to implement an enterprise's environmental management plan and monitoring programs. This involves identifying the need for specific kinds of instruments, determining the suitability of available instruments, procuring and commissioning instruments, checking the serviceability and calibration of instruments, performing routine maintenance, training staff to operate instruments correctly, and maintaining relevant records.

Application of the Unit

This unit of competency is applicable to environmental site coordinators, environmental managers and senior environmental officers working in a range of industry sectors, such as:

- environmental monitoring, sampling and field testing (e.g. air, water, soil and noise)
- geotechnical services
- natural resource management
- occupational hygiene monitoring (e.g. air, noise and radiation)
- water supply and treatment, storm and wastewater management
- solid and hazardous waste management
- site remediation or rehabilitation
- resource efficiency (e.g. energy, water and waste auditing).

Note that the term 'manager' is used to refer to management of a function, project and /or program and does not necessarily imply line management.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

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| 1 | Procure suitable instruments | 1.1 | Determine the types and specifications of instruments required by the enterprise to implement the environmental monitoring program associated with site/project |
| | | 1.2 | Research information about the features of instruments that may be suitable and their suppliers |
| | | 1.3 | Liaise with suppliers and/or conduct tests to compare the stated performance of available instruments against enterprise specifications |
| | | 1.4 | Seek advice/assistance with evaluating instruments if beyond own technical competence |
| | | 1.5 | Select the most suitable instruments and arrange for their procurement |
| 2 | Commission new instruments | 2.1 | Use manufacturer documentation to develop a thorough understanding of instrument operation, functional test procedures, routine instrument checks and maintenance requirements |
| | | 2.2 | Ensure that the instrument has been calibrated appropriately for intended use |
| | | 2.3 | Conduct component checks and test measurements to confirm instrument performance for intended use |
| | | 2.4 | Enter all required information about the new instrument in the enterprise information management system |
| | | 2.5 | Develop and document clear procedures for |

operating, caring for and maintaining the instrument

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| 3 | Train instrument operators | 3.1 | Identify the knowledge and skills required to operate the instrument safely and reliably in the workplace and to interpret the environmental parameters measured |
| | | 3.2 | Develop an appropriate training program for instrument operators using established adult learning principles |
| | | 3.3 | Ensure that each operator can use the instrument competently for the required measurement applications |
| | | 3.4 | Record all training outcomes in accordance with regulator requirements and enterprise procedures |
| | | 3.5 | Audit operator's use of instruments at regular intervals to ensure their ongoing competence |
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| 4 | Maintain instruments fit for purpose | 4.1 | Conduct regular instrument checks and minor maintenance in accordance with enterprise procedures |
| | | 4.2 | Check instrument calibration using specified standards and/or procedures and record all relevant information |
| | | 4.3 | Troubleshoot basic faults and determine whether local repair/maintenance is technically possible and economic |
| | | 4.4 | Arrange for repair or servicing from an accredited agent or other appropriate personnel in accordance with enterprise procedures |
| | | 4.5 | Check instrument performance after repair/service before approving it for use |
| | | 4.6 | Ensure all required instrument records are complete, accurate, legible and secure |

Required Skills and Knowledge

Required skills

Required skills include:

- recognising common types of environmental monitoring instruments and the advantages, disadvantages and limitations of their use
- locating, interpreting and comparing information about environmental monitoring instruments
- selecting suitable instruments by analysing factors, such as intended use (fixed/portable, laboratory/field), range of parameters, accuracy, sensitivity, response time, robustness, serviceability and limitations
- conducting pre-use and calibration checks, troubleshooting common faults, conducting basic repairs and maintaining the enterprise's monitoring instruments
- safely operating the enterprise's monitoring instruments to obtain reliable data
- processing and analysing measurement and uncertainty data
- interpreting manuals and writing operating instructions for monitoring instruments
- seeking advice when issues/problems are beyond scope of competence/responsibility

Required knowledge

Required knowledge includes:

- environmental monitoring terms and concepts, and measurement parameters
- procedures for conducting surveys, monitoring, sampling and in-situ measurements
- instrumentation terms and concepts, such as operating voltage, accuracy, response time, sensitivity, detection limit, linearity and instrument uncertainty
- characteristics, capabilities, limitations, function of key components and operating principles for monitoring instruments used in the enterprise
- role and importance of regular calibration and pre-use checks and maintenance
- common instrument faults, troubleshooting, recommended remedial actions and repairs
- common instrument operator errors
- relevant health, safety and workplace emergency response procedures

Evidence Guide

Overview of assessment	Competency must be demonstrated in the ability to
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	perform consistently at the required standard.
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Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • selecting monitoring instruments that will enable the enterprise to successfully implement its environmental management plan • maintaining sufficient numbers of fully functioning instruments to satisfy the enterprise's predictable requirements • training instrument operators to use monitoring instruments safely and reliably • maintaining accurate and complete records.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or a simulated workplace environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. This unit of competency may be assessed with: • <i>MSS027000 series units dealing with coordination of specific environmental management activities (e.g. water, air and noise).</i> The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Resources may include: • environmental management plans • environmental monitoring specifications, manuals and instruments • enterprise procedures for procurement of equipment and materials.
Method of assessment	The following assessment methods are suggested: • review of records of instrument selection, use and maintenance generated by the candidate • feedback from peers and manager that working instruments are available when required • review of instrument training materials/records generated by candidate • oral/written tests and calculations involving environmental parameters; set-up, calibration and basic maintenance of environmental monitoring instruments • observation of the candidate checking, using and

	maintaining monitoring instruments and/or instructing others in their use. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work-like environment.
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Guidance information for assessment	
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Range Statement

Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
Legislation, standards, codes, procedures and/or enterprise requirements	Legislation, standards, codes, procedures and/or enterprise requirements may include: • federal legislation, such as: • Environment Protection and Biodiversity Conservation Act 1999 • Australian Heritage Council Act 2003 • Native Title Act 1993 • state/territory government legislation and regulations and local government by-laws, policies, and plans dealing with: • land use, acquisition, planning and protection • environmental protection • cultural/heritage protection • vegetation management • nature conservation and wildlife/plant protection • water and water management • soil conservation • pollution and contaminated sites • fisheries, forestry and mining operations • Australian and international standards, such as: • AS 3550 series Water analysis • AS/NZS 3580 series Methods for sampling and analysis of ambient air • AS/NZS 2922 Guide for the siting of sampling units (air monitoring) • AS 1055 series Acoustics - Description and measurement of environmental noise • AS IEC 61672.1:2004 Electroacoustics - Sound level meters - Specifications • AS IEC 61672.2:2004 Electroacoustics - Sound level meters - Pattern evaluation tests • AS IEC 60942:2004 Electroacoustics - Sound calibrators

	• AS/NZS 4323.3:2001 Stationary source emissions - Determination of odour concentration by dynamic olfactometry • environmental management plans, and site information about applicable legislative requirements and approval requirements • information about site processes and work schedules • monitoring/inspection procedures and management actions to prevent/control environmental impacts or risks • sampling and in-situ measurement procedures (e.g. water, air, noise and soils)
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Environmental monitoring instruments	Environmental monitoring instruments may include: • water quality measuring instruments, such as: • specific meters or multi-probes for measuring water parameters, such as dissolved oxygen, electrical conductivity, pH, turbidity, nitrates, phosphates and temperature • field test kits to determine water parameters, such as dissolved gases, chemical anions and cations, heavy metals, E. coli and biological oxygen demand (BOD) • portable colorimeters and field microscopes • air monitoring instruments, such as: • air sampling pumps, flow meters and sampling trains • continuous gas monitors • tapered element oscillating microbalance (TEOM) • portable gas monitors and analysers • weather stations • odour monitoring instruments, such as dynamic olfactometers • noise monitoring instruments, such as: • type 1 and type 2 portable sound level meters • integrating and non-integrating sound level meters • noise dose meters • statistical analysers • sound monitoring stations • data loggers, recorders, telemetry equipment and global positioning system (GPS) • radiation instruments and survey meters, such as: • Geiger-Muller (beta and gamma) • scintillation (alpha, beta and gamma)
Environmental management plans	Environmental management plans provide a framework for managing all environmental aspects, impacts, risks and obligations relevant to a site, project or significant work activity. They may include: • an aim, vision and enterprise policy statement • roles and responsibilities • potential environmental issues • actions to avoid, remedy and mitigate the issues • procedures and forms to minimise and manage specific environmental impacts and risks • quality management plans • communication and training requirements • monitoring schedules, sampling/test procedures, and

	analysis and notification requirements (e.g. exceedance values and quality triggers) • auditing and reporting requirements
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Environmental monitoring programs	Environmental monitoring programs may include surveys, sampling and measurements for: • establishing baseline or quality parameters • determining trends in parameters • investigating causes for changes in parameters • identifying and quantifying contamination at specific locations • identifying sources of possible/actual contamination • determining the effectiveness of environmental management plans, actions and control measures • determining the effectiveness of remediation activities
Specifications and features of instruments	Specifications and features of instruments may include: • types of sampling and/or measurements to be performed • parameters or analytes of interest • detector type, sensitivity and detection limits • response time • linearity • estimated uncertainty for each range • single or multi-probe functions • ease of interfacing with data loggers and computers • power and battery requirements • size, weight, robustness and portability • instrument operating conditions
Adult learning principles	Adult learning principles may include: • explaining aims and objectives of training program • linking learning with everyday work tasks • using a logical sequence of learning activities • presenting new information in manageable chunks • providing opportunities to practise new skills and solve common problems • reinforcing important points • using a range of questions to check understanding • providing regular, constructive feedback
Regular instrument checks and minor maintenance	Regular instrument checks and minor maintenance may include: • cleaning • battery checks and replacement • zero, span and range checks

	• use of one or more references to check calibration/response in each range • adjustment of calibration if authorised to do so • simple fault-finding using instrument manual, error codes and recommended remedial actions
Required records	Required records may include details of: • purchase records, warranties and service agreements for instruments • instrument calibration status • instrument inspection (faults, servicing and repairs) • instrument use (operator, time/date, location) • instrument maintenance schedule and records
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Environmental

Custom Content Section

Not applicable.