Australian Government

Department of Education, Employment and Workplace Relations

ICTRFN4174A Undertake radio communications signals monitoring

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

ICTRFN4174A Undertake radio communications signals monitoring

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to monitor radio communications signals for interference management, investigation, licence conditions intelligence and frequency occupancy purposes with discretion to determine appropriate action according to relevant Acts and regulations. Individuals must comply with radio communications transmitter licensing requirements and operator certificates for maritime and aeronautical services and occupational health and safety (OHS) electromagnetic radiation (EMR) licensing requirements as appropriate.

Application of the Unit

Application of the unit	Field officers from regulatory authorities or other private and public organisations apply the skills and knowledge in this unit. They combine technical skills with broader organisational and administrative skills to monitor and action non-compliance of radio communications. Field officers may be responsible for small projects or parts of larger projects, and for the coordination and direction of small groups working on sites remote from the organisational headquarters.

Licensing/Regulatory Information

Refer to Unit Descriptor

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Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for radio communications signals monitoring	1.1. Prepare for given work according to *relevant legislation*, *codes*, *regulations and standards*, including OHS issues and possible *hazards*
	1.2. Identify the specific *triggers* that lead to the need for *monitoring activities*
	1.3. Determine monitoring coordinates as a result of a client complaint
	1.4. Determine the extent and nature of the communications problem through desktop research and relevant information
	1.5. Enter necessary details into the appropriate work management system
2. Plan and organise monitoring activities	2.1. Determine monitoring activities and *responsibilities* according to organisational requirements
	2.2. Determine *procedures*, timeframes, *resources and equipment* requirements for self and others according to organisational and task requirements
	2.3. Obtain resources and equipment and prepare according to organisational and task requirements
	2.4. Identify communication strategies to make clients aware of their obligations under relevant legislation, codes, regulations and standards according to organisational policy and procedures
	2.5. Update and review procedural and information guides as required
	2.6. Implement *risk management* strategies as required according to set procedures and timelines
3. Undertake monitoring	3.1. Carry out monitoring activities according to organisational and legislative requirements, including OHS
	3.2. Use and maintain resources and equipment according to organisational and task requirements
	3.3. Identify and confirm communications and/or interference problems
	3.4. Locate position and source of communications and/or interference problems
	3.5. Identify the organisation responsible for the communications and/or interference problems
	3.6. Undertake compliance analysis of unlicensed, unauthorised and non-standard equipment if

ELEMENT	PERFORMANCE CRITERIA
	appropriate
	3.7. Provide advice to operational and technical subordinate officers according to organisational policy and procedures as required
4. Act on non-compliance	4.1. Provide information to client and take *action* as a result of failure to achieve compliance according to organisational guidelines and legislative requirements based on the seriousness of the possible breach
	4.2. Identify contraventions of compliance requirements and report recommended action according to organisational policy and procedures
	4.3. Refer serious or complex situations for advice or resolution according to organisational policy and procedures
	4.4. Use relevant *collection methods* to gain information and evidence about elements of each offence to be prosecuted and provide according to legislation, procedures and rules of evidence
	4.5. Conduct and fulfil court attendance requirements in compliance with organisational guidelines as required
	4.6. Ensure case is finalised according to court outcomes and organisational guidelines
5. Provide reports and information	5.1. Interpret requirements of relevant legislation and provide information and advice on technical and operational matters
	5.2. Advise clients affected by outcomes within limits of privacy legislation
	5.3. Maintain *records* and prepare and provide reports according to organisational requirements
	5.4. Update any compliance management systems with relevant findings and outcomes

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

REQUIRED SKILLS AND KNOWLEDGE

Required skills

- communication skills to liaise with a diverse range of clients and staff to promote awareness and action on radio communications issues
- information technology skills for word processing, using statistical data and desktop research
- literacy skills to write reports using standard formats and to read and interpret a range of technical and legal information
- oral presentation skills required for legal settings
- problem solving skills to respond to typical challenges encountered in different radio communications monitoring situations
- research and analysis skills to gather and interpret technical data
- safety skills to operate equipment and vehicles
- technical skills to:
  - operate receiving equipment, antenna systems, remote monitoring systems and workplace equipment
  - operate direction finding equipment
  - use HF, VHF, UHF and microwave receiving techniques
  - use triangulation techniques

Required knowledge

- legislation, codes of practice and other formal agreements that directly impact on monitoring of radio communications signals:
  - specifics of what constitutes an offence
  - responses for non-compliance
  - environmental requirements
  - privacy issues
- specific OHS requirements that impact on monitoring in terms of safety of self and public safety:
  - RF personal protective equipment
  - EMR at RF transmission sites
  - building site induction requirements
  - environmental conditions
- specific monitoring procedures for radio communications and relevant organisational policies and procedures
- characteristics of different environments and workplaces where monitoring takes place
- radio communications systems used in the relevant work context
- specific issues related to antenna performance:
  - directivity
  - gain

REQUIRED SKILLS AND KNOWLEDGE

- height
- effects of cable attenuation and impedance mismatch
- effects of ionosphere:
  - HF propagation
  - warning, fadeout, solar flares
  - ionospheric prediction service (IPS)
- modulation methods, AM, FM and digital formats
- field strength surveys and EMR measurements
- propagation properties of terrain
- RF awareness

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • plan and conduct radio communications signals monitoring activities under general direction in a range of different contexts • comply with site risk control, OHS, environmental, quality and communication requirements • apply knowledge of appropriate procedures and techniques for efficient and effective preparation and operation, including calibration, maintenance and commissioning of instruments and field equipment appropriate to a communications environment site • respond effectively to different challenges and operational requirements for monitoring, including coping with difficulties, irregularities and breakdowns in routine.
Context of and specific resources for assessment	Assessment must ensure: • sites on which monitoring may be conducted • use of monitoring and testing equipment currently used in industry • relevant regulatory and equipment documentation that impact on monitoring activities.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate carrying out monitoring activities • review of monitoring reports completed by the candidate for different sites and equipment • oral or written questioning to assess knowledge of legislation and monitoring procedures • review of the candidate responses to a range of different situations likely to be encountered when conducting monitoring activities.
Guidance information for	Holistic assessment with other units relevant to the

EVIDENCE GUIDE	
assessment	industry sector, workplaces and job role is recommended, for example: • ICTRFN4095A Conduct radio frequency measurements • ICTCMP5176A Undertake radio communications site audit. Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

RANGE STATEMENT	

Relevant legislation, *codes*, *regulations and standards* may include:	• Australian Communications and Media Authority (ACMA) standards
	• Commonwealth legislation and regulations
	• Crimes Act and Criminal Code Act
	• Interception Act
	• International ISO standards
	• International Telecommunications Union (ITU) regulations
	• National Measurements Act
	• OHS Act
	• Privacy Act
	• private property law
	• Radio Communications Act
	• spectrum management legislation
	• state, territory and local government legislation and regulations:
	   • building
	   • conservation and land management
	   • emergencies
	   • environmental protection
	   • international legislation/codes of behaviour
	• Telecommunications Act.

Hazards may include:	• environmental conditions:
	   • broken ground
	   • dust
	   • flora and fauna
	   • location involving working over old underground workings and voids
	   • materials
	   • natural landscapes
	   • noise
	   • run-off and spills
	   • waste management and disposal
	   • water quality
	   • wet conditions
	   • working at heights or on roof tops
	• safety issues:
	   • electromagnetic radiation
	   • emissions

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RANGE STATEMENT	

	• EMR based on site power
	• hazardous chemicals
	• laser output
	• underground plant
	• vehicle safety:
	   • 4WD
	   • driving in adverse conditions
	   • winches.

Triggers may relate to:	• assisting frequency assigners prior to allocations • broadcast survey at head office request • complaints • complaints in writing • expired licences • field strength for low power open narrowcasting (LPONS) and digital action plan (DAP) • interference • investigations • monitoring to check complaint is legitimate or interference occurring may be intermittent interference • monitoring of high demand spectrum when a large user is requesting more spectrum whilst appearing to be using their existing inefficiently • noise floor measurements for spectrum planning • proactive compliance activity • site audits • special events monitoring under contract • task created as a result of monitoring.
Monitoring activities may include or relate to:	• audio content • channel usage (orphans) • deviation • EMC issues • feed into investigation • field strength • focused and benchmark audit activities • frequency • modulation

RANGE STATEMENT	
	• occupancy • other compliance assurance activities • power • radiation patterns • radio communications audit • radio interference complaint • spectrum display • surveillance • transmitted data • unlicensed services or content • verification of adherence to licence conditions.
Responsibilities may relate to the roles of:	• inspection specialists • line managers • program managers • project managers • senior inspectors • senior policy officers • supervisors.

Procedures may include:	• broadcast tower safety
	• channel occupancy with transmitter operating
	• decisions to target certain sites:
	   • communal
	   • power level
	• emergency procedures
	• evacuation procedures
	• geographical considerations
	• handling procedures
	• incident reporting procedures
	• interference complaints
	• investigation of power measurement to ensure correct power
	• ITU monitoring handbook
	• legislative requirements such as provisions of the
	• licence conditions regarding the operating frequency of transmitters
	• measurement procedures
	• monitoring instructions and policies
	• observation
	• OHS

RANGE STATEMENT

	• organisational guidelines and code of conduct • power company requirements • RADCOM data purification • rejection procedures • safety procedures • sampling procedures • site visit compliance instruction procedure guide • statutory authority requirements (ACMA) • storage procedures.

Resources and equipment may include:	• antenna configuration
	• Argus monitoring - software
	• communication equipment
	• communications receivers
	• dedicated HF monitoring stations
	• desk monitor equipment, such as universal monitoring remote control system (UMRCS)
	• Doppler systems
	• electronic recording equipment - multi-track
	• entry authority or warrant
	• field strength measurement
	• global positioning system (GPS) equipment
	• hand-held equipment
	• portable monitoring equipment
	• Radphones
	• receiver protection:
	    • attenuators
	    • filters
	• recording equipment
	• remote access of carriers monitoring systems through software installed on a desktop and dialup number for monitoring
	• satellite imagery
	• scanners
	• spatial data and information
	• spectrum analysers
	• storage equipment and facilities
	• vehicle mounted and mobile direction finding equipment
	• vehicles 2 or 4WD.

RANGE STATEMENT	
Risk management strategies may relate to:	• access • control • monitoring.
Action may include:	• advice • court prosecution • formal notification of intent • infringement notices • on-the-spot fines • warning.
Collection methods may include:	• determination of land ownership • interviewing • maintenance of case files • observation • recording • seizure.

Records may include:	• case files
	• forms:
	   • application,
	   • notification
	• invoices
	• notices:
	   • infringement
	   • seizure
	• receipts
	• statistics.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units	

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Co-requisite units		

Competency field

Competency field	Radio frequency networks