



Australian Government

UEENEEM076A Use and maintain the integrity of a portable gas detection device

Release 3

UEENEEM076A Use and maintain the integrity of a portable gas detection device

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

1)

1.1) Descriptor

This unit covers the gas detection aspects of ensuring a work place is safe from explosive and toxic gases and vapours. It requires the ability to use measuring instruments accurately, follow written instructions and to write instructions for others.

This unit is directly equivalent to the Unit *2.4 Use and maintain the integrity of portable gas detection devices* in the Australian/New Zealand Standard *AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards*. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Application of the Unit

Application of the Unit

4)

This unit augments other formally-acquired competencies in a relevant industry and shall be used only in conjunction such competencies. It applies to job function that requires entry to a designated hazardous area to undertake repair, maintenance or construction work at AQF 3 level or higher. It is suitable for employment-based programs under an approved contract of training.

Note:

Examples of relevant industries include aviations, electrical installation and maintenance, fuel storage and dispensing industrial process, instrumentation and control,

Application of the Unit 4)

marine, material handling and storage, mining, and petrochemical.

Licensing/Regulatory Information**1.2) License to practice**

The skills and knowledge described in this unit require a license to practice in the workplace subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites**Prerequisite Unit(s) 2)****2.1) Competencies**

Granting competency in this unit shall be made after or concurrently with confirming competency in any one of the following units.

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AND

Competencies required by a given industry or enterprise for plant or machinery operation or installations, maintenance or service functions at least at AQF 2 or equivalent.

Employability Skills Information

Employability Skills

3)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 Prepare to use portable gas detection device.

1.1 The need to initiate gas detection is identified by OHS requirements and established procedures.

1.2 The gas or vapour to be detected is established from plant/site records or consultation with relevant personnel.

1.3 Gas detection device(s) for the gas/vapour to be detected is/are checked for calibration and response in accordance with manufacturer instructions.

1.4 Gas detection devices are checked for factors that could nullify the Ex rating.

Note:

This would include damaged casing, use of incorrect batteries and/or chargers, use of incorrect spare parts and accessories.

ELEMENT	PERFORMANCE CRITERIA
2 Establish safety of the area with regards to the presence of gases or vapours.	2.1 OHS policies and procedures relating to gas/vapour detection are followed.
	2.2 Gas detection device is used in accordance with manufacturer instructions and with regards to environmental conditions.
	2.3 Observations of gas detection readings are recorded in accordance with established procedures.
	2.4 Safe-to-work is determined from gas detection reading and then clearance to work is issued in accordance with established procedures.
3 Monitor gas detection devices for the presence of gases/vapours.	3.1 The frequency of monitoring is determined from the nature of gas/vapour and the effect of environmental and local conditions (e.g. ambient temperature rise, density of gas/vapour, flash point, dew point and detector position).
	3.2 Others are instructed in procedures to carry out monitoring and these instructions are documented.
4 Follow procedures to maintain gas detection devices.	4.1 Gas detection devices are stored in accordance with manufacturer recommendations.
	4.2 Gas detection devices are formally checked and calibrated periodically in accordance with established site requirements and instrument accuracy.
	4.3 Storage, use and calibration record of the gas detection devices is maintained, in accordance with the established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and using and maintaining the integrity of portable gas detection devices.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

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6A

Evidence shall show an understanding of portable gas detection devices to an extent indicated by the following aspects:

T1 Principles of gas detection and the use and care of portable gas detection devices encompassing:

- Fundamental principles in the use of gas and vapour instruments.
- Use of manufacturer's instruction manual (Instruction manuals include operating instructions, adjustment procedures, operational limitations, and storage).
- Calibration and response checking.

T2 Detecting gases and vapours encompassing:

- apparatus capability and users' knowledge;
- propagation of gases - This includes release of gas and vapours, ventilation, density, temperature and location.
- gases to be detected and not to be detected;
- intended application;
- environmental effects;
- safety when monitoring for flammable gases where personnel could be present;
- common properties of gases and vapours - This includes density of gases, vapours and their mixtures; effect of temperature on density; LEL and UEL of combustibles and toxicity.
- the differences between detecting gases and vapours - These include added complication of evaporation, condensation and temperature effects of vapours and their effect on propagation, calibration and detection, including sampling.

T3 Oxygen deficiency and effects on safety encompassing:

REQUIRED SKILLS AND KNOWLEDGE

- chemical reaction of oxygen with solid products;
- chemical reaction of oxygen with gaseous products; and
- dilution of the air by displacement by some other gas or vapour.

T4 Measuring principles of catalytic sensors, electrochemical sensors, infrared sensors and semi-conductor sensors encompassing:

- common applications;
- limitations and safety;
- interferences of other gases with the measurement; and
- poisoning of the sensor.

NOTE: Detailed information on gas detection is given in AS/NZS 60079.29.2.

T5 Limits of gas detection of flammable (combustible) gas equipment, encompassing—

- limit to which flammable gas detection equipment will only detect gases and vapours that are present in the vicinity of the detector (or in the line of sight of open path apparatus); and
- limit to which flammable gas equipment will not detect combustible liquids as such, or combustible mists, dusts, or fibres.

T6 Limits of vapour detection of flammable (combustible) gas equipment (flammable gas detection equipment will only detect those vapours that do not condense at the temperature of the detector or its sampling equipment).

T7 Interpretation of gas detection instrument readings (behaviour) encompassing:

- upscale reading in the presence of a gas for which an instrument is not calibrated;
- causes of erratic indications;
- reading of low concentrations of gas of interest; and
- off-scale readings.

T8 Toxicity level of flammable gases and vapours and their potential for occurring in a given situation.

T9 Issues with gas and vapour detection in confined spaces.

T10 Use of the manufacturer's instruction manual (operating instructions, adjustment procedures, operational limitations, storage).

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of 9.2)

EVIDENCE GUIDE

evidence required to demonstrate competency in this unit

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Use and maintain the integrity of portable gas detection devices as described in 8) and including:
 - A Following work permits and clearance procedures.
 - B Monitoring hazards and following evacuation procedures.
 - C Determining whether the gas/vapour level in a work area is safe from explosive, toxic and oxygen deficiency aspects.
 - D Following procedures to maintain the integrity of

EVIDENCE GUIDE

gas detection devices

- E Instructing others in the use of a portable gas detection device in relation to a specific activity.
- F Applying relevant contingency management skills.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should also be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to using and maintaining the integrity of portable gas detection devices.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment primarily intended for learning/assessment which incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort competency development in this unit may be arranged concurrently with the following units

EVIDENCE GUIDE

UEENEEM080A Report on the integrity of explosion-protected equipment in a hazardous area

and

Competencies required by a given industry or enterprise for plant or machinery operation or installations, maintenance or service functions at least at AQF 2 or equivalent chosen as a prerequisite

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to any classified hazardous area or confined space.

The following constants and variables included in the element/performance criteria in this unit are fully described in the Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	3	Writing	3	Numeracy	3
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Custom Content Section

Competency Field 5)

Hazards