



Australian Government

UEENEEM052A Classify hazardous areas - gas atmospheres

Release 4

UEENEEM052A Classify hazardous areas - gas atmospheres

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

1)

1.1) Descriptor

This unit covers knowledge and skills to classify areas where flammable/combustible potentially explosive materials may exist. It requires the ability to gather and analyse data relative to explosion hazards, determine the extent of risk and establish and document zones.

This unit is directly equivalent to the Unit *2.16 Classify hazardous areas* 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 engineering job function at, at least, an engineering associate level.

Note:

Examples of relevant industries include aviations, electrical installation and maintenance, fuel storage and dispensing industrial process, instrumentation and control, marine, material handling and storage, mining, and petrochemical.

Licensing/Regulatory Information

1.2) License to practice

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety.

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:

UEENEEE0 Write specifications for electrical
71B engineering projects

OR

UEENEEE0 Write specifications for industrial
75B electronics and control projects

OR

UEENEER0 Contribute to the conduct of a research
02B project

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 Determine the type and extent of explosion hazard.	1.1 Functions and process equipment in the area are determined and hazardous materials identified from specifications, hazard and risk assessment and/or written consultation with process specialist personnel.
	1.2 Explosion and physical properties of hazardous materials are listed, together with the title of the authority from which the data is obtained.
	1.3 Gas Groupings and temperature class of flammable gases and vapours and /or dust that may be present in the area are established from collected data.
	1.4 Potential sources of release and/or dust layering are identified from specifications, and/or written consultation with process specialist personnel.

ELEMENT	PERFORMANCE CRITERIA
2 Establish the type and extent of zones.	2.1 Zones are determined by similarity to examples in Standards or from first principles.
	2.2 Where first principles are used, grades, sources and magnitude of release and dust layering are established from specifications and diagrams and reviewed with process specialist personnel. Note: This should include such matters as ventilation assessment, housekeeping assessment and calculations.
3 Document classification and delineation of zones.	3.1 Area classification documentation is completed in accordance with requirements and submitted to appropriate personnel.
	3.2 Classification documentation records are filed for future reference and for incorporation in the verification dossier.

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 classifying hazardous areas.

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

KS01-EM052A Hazardous areas classification

Evidence shall show an understanding of processes involved in gathering and analysing technical data to classify non-specific hazardous areas. The following aspects indicate the extent of understanding required.

T1 Occupational Health and Safety responsibilities related to hazardous areas encompassing:

- the main features and purpose of a 'clearance to work' system (includes hot work permit systems).
- typical safety procedures that should be followed before entering a hazardous area;
- the purpose of gas detectors and their limitations;
- effects of temperature on gas and vapour detection;
- frequency of monitoring for presence of gas or vapours, i.e. effects of temperature rise;
- factors affecting the accuracy of gas detectors, for example, contamination, condensation, temperature;
- safety in use of gas detectors, for example, 'read and run concept'
- the safety precautions to be taken when working in a hazardous area.

T2 The roles of the parties involved in the safety of hazardous areas encompassing:

- common Acts and Regulations related to the safety of hazardous areas and the Authorities responsible for their implementation;
- where assistance and further information can be obtained to assist persons with hazardous area responsibilities, for example, Standard bodies, experienced consultants; and
- the hazardous area responsibilities of the owner of premises in which a hazardous area exists; the occupier of premises in which a hazardous area exists; enterprises and personnel engaged in installation and/or maintenance of explosion-protection systems; enterprises and personnel engaged in the classification of hazardous areas and/or design of explosion-protection systems; enterprises and personnel engaged in the overhaul, modification and/or assessment of explosion-protected equipment;

REQUIRED SKILLS AND KNOWLEDGE

enterprises and personnel engaged in the inspection of explosion-protection installations; manufacturers of explosion-protected equipment; designated authorities; insurers.

T3 Properties of combustible substances and their potential to create an explosive hazard encompassing:

- condition in the workplace that will lead to an explosion;
- the terms 'combustion', 'ignition' and 'propagation';
- explosive range of substances encountered in the workplace i.e. LEL/UEL;
- explosive parameters of substances as given in tables of substance properties

Note: Combustible materials are gases, vapours (from liquids), and dusts; flash point.

- the difference between gases and vapours; and
- the toxic nature of gases and vapours and potential harmful consequences.

T4 The nature of hazardous areas encompassing:

- the Standards definition of a 'hazardous area';
- the recommended methods for classifying the type and degree of explosion hazard in an area;
- hazardous area classifications as defined by Standards; and
- factors that are considered when a hazardous area is classified.
- the basics of how explosion-protection is achieved by the methods of exclusion, containment, energy limitation, dilution, avoidance of ignition source.

T5 The process of classifying hazardous areas encompassing:

- methods by which an area can be classified;
- the characteristics/attributes of an area that should be considered in the classification process, for example, type of process, nature of plant, source and nature of release;
- the requirements and Standards for classifying a hazardous area; and
- the responsibilities of the owner/occupiers for classification of a hazardous area.

T6 The likelihood (zoning) or risk assessment method of an explosive hazard encompassing:

- ignition properties of materials relevant to determining the likelihood and extent of an explosive hazard;
- sources for obtaining data on ignition properties of materials under the conditions in which they could be present in a given process;
- methods for assessment and calculation of factors such as release rate, ventilation and dispersion characteristics; and
- means for reducing hazard risk.

T7 The extent of an explosive hazard and classifying an area accordingly encompassing:

- the extent of zones for an area given data on the likelihood of the explosive hazard

REQUIRED SKILLS AND KNOWLEDGE

for that area;

- requirements for documenting the classification of a hazardous area; and
- the extent of the zones, temperature classes and gas groups on site drawings in a hazardous area.

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

EVIDENCE GUIDE

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 evidence required to demonstrate competency in this unit

9.2)

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:

EVIDENCE GUIDE

- 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, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Classify hazardous areas as described in 8) and including:
 - A Accessing necessary information and identifying hazardous products involved in a given process, explosive properties of materials involved in a given process, and potential sources and characteristics of release of hazardous products.
 - B Analysing data in the context of explosion risk.
 - C Determining area delineation and documenting area classifications.
 - D Applying relevant contingency management skills.

EVIDENCE GUIDE

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 classifying hazardous areas.

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 competencies related to gathering and analysing technical data and using this data for assessing risk.

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 must be demonstrated in relation to classifying a hazardous area in which gases are potentially an explosive hazard.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in 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	4	Writing	4	Numeracy	4
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Custom Content Section

Competency Field	5)
	Hazards