



Australian Government

Department of Education, Employment and Workplace Relations

UEENEEM021A Attend to breakdowns in hazardous areas - dust atmospheres

Release: 2

UEENEEM021A Attend to breakdowns in hazardous areas - dust atmospheres

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

1)

1.1) Descriptor

This unit covers the explosion-protection aspects of attending to a breakdown in a hazardous area or of explosion-protected and associated equipment. It requires the ability to ascertain the nature of a breakdown, the extent of repairs required and the personnel needed to repair the breakdown.

This unit is directly equivalent to the Unit 2.3 *Attend to breakdowns in 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 and is intended to apply to plant/equipment service and maintenance job functions in the disciplines of electrical, instrumentation, communication or mechanics at AQF 3 or higher. It is suitable for employment-based programs under an approved contract of training.

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.

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

AND

Competencies in attending to breakdowns in general electrical or instrumentation equipment mechanical plant/equipment service and maintenance at least at AQF 3 or equivalent. Examples are (but not limited to):

UEENEEG005B Verify compliance and functionality of general electrical installations

UEENEEI012B Verify compliance and functionality of process control installations

MEM7.1B Perform operational maintenance of machines/equipment

For the full prerequisite chain details for this unit please refer to Table 2 in Volume 1, Part 2

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 attend breakdown. | 1.1 | Nature of the breakdown is confirmed with appropriate personnel to establish the need to enter the hazardous area. |
| | | 1.2 | Maintenance records of equipment related to the reported breakdown are review for possible causes. |
| | | 1.3 | Safety to enter the hazardous area is established in accordance with established procedures and relevant clearance to do the work is obtained. |
| | | 1.4 | Testing devices and tools, anticipated as being needed for the work, are obtained and checked for correct operation and safety. |

ELEMENT	PERFORMANCE CRITERIA
2 Evaluate extent of work.	2.1 OHS policies and procedures for working in a hazardous area are followed.
	2.2 Extent of breakdown is evaluated and confirmed with appropriate personnel.
	2.3 Other personnel required to determine cause and rectify breakdown is ascertained from available evidence and arrangements made for their attendance where applicable.
	2.4 Extent of repair work is ascertained from available evidence and confirmed with appropriate personnel.
	2.5 Limits of repair work that can be carried out in-situ are established with regards to explosion risk and in accordance with established procedures and requirements.
3 Arrange repair work.	3.1 Equipment is isolated in accordance with established procedures.
	3.2 Circuits of equipment being withdrawn from service are terminated or isolated safely and in manner approved for the classification of the area.
	3.3 Certification documentation for replacement equipment is sighted to ensure that it is identical with the equipment it replaces and is in accordance with the explosion-protection system design.
	3.4 Repair work carried out in-situ is done in accordance with established procedures and requirements.
4 Confirm completion of work.	4.1 Explosion-protected equipment and systems are inspected and tested by appropriately qualified personnel after repairs are completed to ensure the integrity of the system.
	4.2 Appropriate personnel are notified of the completion of the repair work and details are documented in accordance with established procedures and requirements.

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 attending to breakdowns in hazardous areas.

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

KS01-EM021 Explosion protection, certification and techniques

A

Evidence shall show an understanding of Ex certification schemes and techniques to accepted Standards to an extent indicated by the following aspects:

- T1 Explosion-protection equipment — Ex certification schemes encompassing:
- Purpose and scope of certification schemes.
 - Schemes accepted in Australia and New Zealand.
 - Schemes commonly used in countries other than Australia and New Zealand.
 - Processes for having equipment certified under the acceptable Ex schemes — scheme procedures; quality management requirements; conformance testing and assessment; and requirements for ongoing certification.
- T2 Flameproof (Ex ‘d’) explosion-protection technique encompassing:
- The purpose and characteristics of the design features of apparatus and circuits protected by the flameproof (Ex ‘d’) technique. (Examples of characteristics and design features are flame paths, integrity under pressure, pressure piling, and enclosure entries).
 - Typical situations where the flameproof explosion-protection technique is used;
 - Actions or conditions that would void the protection provided the Flameproof technique;
 - The use of Standards in determining the requirements to which the installation of flameproof explosion-protected apparatus shall comply.
- T3 Increased safety (Ex ‘e’) explosion-protection technique encompassing:
- The purpose and characteristics of the design features of apparatus and circuits protected by the Increased safety (Ex ‘e’) technique (Examples of characteristics and design features are temperature rise, maximum power dissipation, protection devices, certified components, creepage and clearance

REQUIRED SKILLS AND KNOWLEDGE

distances, absence of sparking contacts and enclosure entries).

- Typical situations where the Increased safety explosion-protection technique is used;
- Actions or conditions that would void the protection provided the Increased safety technique;
- The use of Standards in determining the requirements to which the installation of Increased safety explosion-protected apparatus shall comply.

T4 Non-sparking (Ex 'n') explosion-protection technique encompassing:

- The purpose and characteristics of the design features of apparatus and circuits protected by the Non-sparking (Ex 'n') technique (Examples of characteristics and design features are creepage and clearance distances and restricted breathing).
- Typical situations where the Non-sparking explosion-protection technique is used;
- Actions or conditions that would void the protection provided the Non-sparking technique; and
- The use of Standards in determining the requirements to which the installation of Non-sparking explosion-protected apparatus shall comply.

T5 Intrinsic safety (Ex 'i') explosion-protection technique encompassing:

- The purpose and characteristics of the design features of apparatus and circuits protected by the Intrinsic safety (Ex 'i') technique (Examples of characteristics and design features are field devices, cables, safe area devices, earthing, entity versus integrated system concept, simple devices and interface devices and their parameters, segregation, infallible components, current and voltage limiting, creepage and clearance distances).
- Typical situations where the Intrinsic safety explosion-protection technique is used;
- Actions or conditions that would void the protection provided the Intrinsic safety;
- The use of Standards in determining the requirements to which the installation of Intrinsic safety explosion-protected apparatus shall comply.

T6 Pressurization (Ex 'p') explosion-protection technique encompassing:

- The purpose and characteristics of the design features of apparatus and circuits protected by the Pressurization (Ex 'p') technique (Examples of characteristics and design features are exclusion and dilution; purge periods, controlled shut down, monitoring and sources of internal release).
- Typical situations where the pressurization explosion-protection technique is used;
- Actions or conditions that would void the protection provided the pressurization technique;

REQUIRED SKILLS AND KNOWLEDGE

- The use of Standards in determining the requirements to which the installation of pressurization explosion-protected apparatus shall comply.
- T7 Enclosures for dusts (Ex 'tD') - explosion-protection technique encompassing:
- The purpose and characteristics of the design features of apparatus and circuits protected by the techniques for dusts (Examples of characteristics and design features are for enclosures; pressurization; encapsulation; and intrinsic safety).
 - Typical situations where the each dust explosion-protection technique is used;
 - Actions or conditions that would void the protection provided the each dust technique;
 - The use of Standards in determining the requirements to which the installation of dust explosion-protected apparatus shall comply.
- T8 Common characteristics of explosion-protection techniques encompassing:
- The purposes of 'temperature classification' and 'gas grouping/apparatus grouping'.
 - Compliance plate markings.
 - Limitations of non-metallic or specific alloy enclosures.
 - The purpose of conformity and certification/approval for equipment used in hazardous areas.
 - Environmental conditions that may impact on explosion-protection techniques.
 - The principles and applications of other and mixed explosion-protection techniques (Other techniques include encapsulation Ex 'm'; oil-immersion Ex 'o'; powder-filling Ex 'q', ventilation Ex 'v' and special protection Ex 's').
 - Features and purpose of conduit seals and cable termination devices designed for use in hazardous areas (These include conduit seals and barrier and compression glands for cables with or without armouring, screening and/or drain wires).

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:
 - Attend to breakdowns in hazardous areas as described in 8) and including:
 - A Following work permits and clearance procedures.
 - B Monitoring hazards and following evacuation procedures.
 - C Following plant and electrical isolation procedures.
 - D Correctly evaluating extent of breakdowns.

EVIDENCE GUIDE

- E Interpreting certification documentation in relation to repair and replacement.
- F Following established breakdown procedures.
- G 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 attending to breakdowns in 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 unit:

EVIDENCE GUIDE

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

Competency unit in attending to breakdowns in general electrical or instrumentation equipment mechanical plant/equipment service and maintenance at least at AQF 3 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 classified dust hazardous area and all the following explosion-protection techniques:

- Intrinsic safety, (Ex 'i')
- Protection by enclosure-dusts, (Ex 't')
- Pressurization, (Ex 'p')

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