



Australian Government

UEEHA0021 Design explosion-protected electrical systems and installations

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to apply explosion-protection aspects in designing electrical power, control and instrumentation systems and installations for hazardous areas.

It includes: understanding of the explosion-protection required for electrical installation for hazardous areas; determining the scope of the required electrical installation from hazardous area classification drawings, process specifications and plant design; documenting detailed specifications of compliant explosion-protected equipment and wiring systems, equipment locations, cable routes; and obtaining and interpreting the standards to which the installations need to comply.

This unit applies to electrical, instrumentation and control engineering design job functions.

Site-specific work permits may be required to work in the hazardous environment. In addition, other permits may be required, such as confined space and to operate specific pieces of equipment such as elevated work platforms in various jurisdictions.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

This unit of competency and associated assessment requirements is adopted from clause 2.13 of AS/NZS 4761.1:2018 Competencies for working with electrical equipment for hazardous areas (EEHA). There may be differences between the content of this unit and AS/NZS 4761.1:2018, so the Standard must be checked to ensure compliance with it. Clause 2.13 of AS/NZS 4761.1:2018 also includes the following precondition for assessment:

- “A candidate seeking assessment in this unit shall have been deemed competent to design general electrical and control systems and installations at AQF level 6 or NZQF level 7 or equivalent.”

Pre-requisite Unit

UEEHA0022 Determine the explosion-protection requirements to meet a specified classified hazardous area

Competency Field

Hazards

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Establish the explosion-protection requirements for an electrical system and installation

2 Incorporate the explosion-protection requirements in electrical systems and installation design

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Explosion- protection requirements for electrical installation for hazardous areas are obtained, interpreted and applied

1.2 Hazardous area classification drawings, process specifications and plant design documentation are reviewed and the scope of the required electrical installation determined

1.3 Explosion-protection requirements are determined from reviewing the standards to the installation is required to comply

2.1 Consideration is given to locating electrical equipment in non-hazardous areas, where possible

2.2 The installation is designed to maximise ease of access for inspection and maintenance

2.3 Ability to obtain the required degree of operational safety for the installation is incorporated in the design

2.4 The specification for the ratings and characteristics of electrical equipment in the installation are compatible with the explosion-protection requirements

2.5 Engineering principles are applied to ensure the parameters for each equipment type, equipment group,

		equipment temperature class, cables and other factors for correct application are compliant and correctly specified
	2.6	Equipment is specified for the explosive atmosphere, zone and external influences in the locations where equipment is to be installed
	2.7	Wiring systems (cables, supports, enclosures) are specified for the atmosphere, zones and external influences along the routes where they are to be installed
3	Document and finalise design	
	3.1	Design is checked for compliance with the requirements established for the electrical system and installation
	3.2	Design is documented to include specification of all explosion-protected equipment and wiring systems, equipment location and cable route drawings and compliance documents for each item of explosion-protected equipment
	3.3	Design is submitted for appropriate organisational approval and, where applicable, statutory or regulatory approval
	3.4	Approved copies of design documents are included in the verification dossier

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Electrotechnology Training Package Companion Volume Implementation Guide.

Essential operating conditions include:

- an engineering office engaged in electrical design of electrical systems and installations for explosive atmospheres
- hazardous area classification drawings
- process specifications
- plant design documentation

- relevant standards and codes and relevant technical data from manufacturers of explosion-protected equipment

Unit Mapping Information

This is a new unit.

Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>