



Australian Government

UEEHA0005 Install explosion-protected equipment and associated apparatus and wiring systems

Release: 1

UEEHA0005 Install explosion-protected equipment and associated apparatus and wiring systems

Modification History

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

Application

This unit involves the skills and knowledge required to install explosion-protected equipment and associated apparatus and wiring systems for hazardous areas. It includes understanding and applying the explosion-protection aspects of installing electrical equipment and wiring systems for hazardous areas; matching items of explosion-protected equipment with that specified for a given location; and complying with installation standards and retaining/completing the required documentation. It is adopted from clause 2.5 of AS/NZS 4761.1:2018 Competencies for working with electrical equipment for hazardous areas (EEHA).

This unit applies to hazardous area electrical installation functions.

Site-specific work permits maybe 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.

Pre-requisite Unit

UEEHA0004 Enter a classified hazardous area to undertake work related to electrical equipment

UEEHA0003 Determine the explosion-protection requirements to meet a specified classified hazardous area

and

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations

or

UEEEL0028 Conduct compliance and functional verification of electrical apparatus and existing circuits

or

UEEIC0048 Verify compliance and functionality of instrumentation and control installations

Competency Field

Hazardous

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to install equipment and wiring

PERFORMANCE CRITERIA

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

- 1.1** WHS/OHS procedures and safe work methods are obtained and interpreted
- 1.2** Knowledge of requirements for installing electrical equipment and wiring for a hazardous area is applied to work preparation
- 1.3** Types of explosion-protected equipment and wiring systems to be installed are determined from the area classification and planning and/or design documentation
- 1.4** Location in which specific items of equipment and circuits are to be installed is determined from the area classification and planning and/or design documentation
- 1.5** Explosion-protected equipment markings are checked to ensure they conform to their certification document and planning and/or design specifications
- 1.6** Certification document supplied with each item of equipment is collected for forwarding to the relevant person for filing in the verification dossier
- 1.7** Cables and cable enclosures to be installed are checked to ensure they conform to planning and/or design documentation
- 1.8** Cable glands, seals and conductor terminations are checked to ensure they are compatible with the cable types and equipment specified in the planning and/or design documentation

- 1.9** Special tools, equipment and testing devices needed to carry out the installation work are checked to ensure they are safe and serviceable, and any defective items are either rectified or replaced
- 2 Install equipment and wiring systems**
- 2.1** Safe work methods statements (SWMS) relating to explosive atmospheres are obtained and applied
- 2.2** Installation of equipment and wiring systems demonstrates application of knowledge of requirements for installing electrical equipment and wiring for hazardous areas
- 2.3** Equipment enclosure covers and internal components are removed where needed to enable installation and covers, components and their fixing devices are stored to protect them against loss or damage
- 2.4** Equipment is installed to conform with the planning and/or design documentation, installation standards and within the limits specified by the equipment certification and manufacturer's instructions
- 2.5** Equipment is installed in a manner that maintains the integrity of protection afforded by the equipment type
- 2.6** Cables and conduits are installed to conform with installation standards, planning and/or design documentation
- 2.7** Cables and conduits are terminated to conform with installation standards and equipment certification and manufacturer's instructions
- 2.8** Circuits are tested before connecting them to devices to ensure protective earth resistance is sufficiently low, insulation resistance is safe, polarity and connections are correct and each circuit complies with installation standards
- 2.9** Conductors are terminated and connected complying with planning and/or design documentation, installation standards, equipment certification and manufacturer's instructions
- 2.10** Equipment covers and internal components are removed to enable installation and are replaced ensuring the integrity of the equipment type is not compromised

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| 3 Confirm that installation is complete | 3.1 Appropriate person/s is notified that the installation has been completed and is ready for the initial inspection |
| | 3.2 Action is taken to rectify non-conformance and general installation defects found during the initial inspection and to ensure the installation complies with requirements |
| | 3.3 Documents used during the installation are forwarded to the person responsible for compiling 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 UEE Electrotechnology Training Package Companion Volume Implementation Guide.

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| Installing explosion-protected equipment and associated apparatus and wiring systems must apply to: | <ul style="list-style-type: none">• new installations and additions, and repairs to existing installations related to a classified hazardous area |
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Unit Mapping Information

No equivalent unit.

Links

Companion Volume implementation guides are found in VETNet - - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEHA0005 Install explosion-protected equipment and associated apparatus and wiring systems

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- preparing to install, including:
 - reviewing safe work methods associated with the classified area in which the work is to be carried out
 - determining the types and locations of equipment and cabling to be installed from area classification and planning and/or design documentation
 - completing pre-installation checks, including:
 - equipment supplied complies with planning and/or design specifications
 - equipment marking conforms to the certification documentation provided with the equipment
 - cables and cable enclosures to be installed conform to planning and/or design documentation
 - cable glands, seals and conductor terminations are suitable for the cable types and equipment specified
 - serviceability and safety of tools and testing devices needed to carry out the installation work is checked
- installing Ex ‘d’, Ex ‘e’, Ex ‘i’ and Ex ‘t’ equipment and associated apparatus and wiring systems, including:
 - obtaining and applying safe work method statements (SWMS) relating to the work
 - carrying out the installation to requirements, including:
 - removing equipment enclosure covers and internal components and their fixing devices to enable installation and safe storage
 - installing equipment to conform to planning and/or design documentation, installation standards, manufacturer’s instructions and limitations
 - installing equipment in a manner that maintains the integrity of the equipment protection type
 - testing circuits before connecting them to ensure:
 - resistance of protective earthing conductors is sufficiently low

- insulation resistance is safe
 - polarity and connections are correct
- replacing internal components and equipment covers previously removed to enable installation
- terminating cables and conduits conforming with installation standards and equipment certification and manufacturer's instructions, including:
 - installing conduit systems, including seals to meet hazardous area requirements (gases and liquids)
 - terminating cables with a barrier gland (gases and liquids)
 - terminating multicore, steel wire armoured (SWA), overall screened and individual screened cable into an enclosure
 - terminating and connecting conductors in accordance with requirements
- replacing equipment internal components and covers ensuring the integrity of the equipment type
- confirming that installation is complete, including:
 - notifying an appropriate person that the installation is completed and ready for the initial inspection
 - taking action to rectify any installation defects revealed by the initial inspection
- forwarding documents used during the installation to the person responsible for compiling the verification dossier.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- safe work procedures for explosive gas atmospheres, including:
 - work health and safety (WHS)/occupational health and safety (OHS) procedures for working in hazardous areas
 - permit to work that covers the hazardous aspects of the specific work and location
- requirements for installing equipment and wiring systems for explosive atmospheres, including:
 - required documentation
 - installation requirements for protection from dangerous (incendive) sparking including:
 - earthing system requirements
 - SELV and PELV systems
 - electrical separation
 - limitation of equipment installed above a hazardous area
 - requirements for potential equalisation for the following:
 - various earthing systems
 - bonding systems

- cable armour and screens
- exposed conductive parts
- metallic enclosures
- temporary bonding
- limitation of cathodic protection
- wiring systems, including:
 - limitation on the use of aluminium conductors
 - fixed cable and wiring systems permitted for Groups I, II and III
 - the wiring systems permitted and not permitted in or above hazardous areas
 - cables supplying transportable and portable equipment
 - flexible connections and flexible cables
- connection to equipment, including:
 - cable glands and blanking elements per enclosure type
 - non-electrical entries
 - conduit systems
 - termination of conductors
 - treatment of unused core
 - unused opening/entries in enclosures
 - joining cables
 - openings in walls
 - passage and collection of flammables
- additional requirements for each type of explosion protection
- cable and conduit termination devices and techniques, including:
 - cable glands, conduits and sealing including:
 - types of glands and components
 - techniques for fitting glands and applying sealing compound
 - techniques for using conduit seals and applying sealing compound
- conductor terminations and techniques, including:
 - installing conduit systems, where applicable, including seals to meet hazardous area requirements (gases and liquids)
 - terminating a cable with a barrier gland (gases and liquids)
 - terminating a multicore, SWA, overall screened and individual screened cable into an enclosure
 - methods for terminating MIMS cable in accordance with manufacturer's instructions
 - testing termination/connections of installed cables/circuits.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions and include:

- an area designated as a hazardous area which is a close facsimile of a real work environment
- an area entry point
- delineation of the area into zones for both gas and dust
- a person to act as the ‘authorised person’ for the site
- a qualified supervisor.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate tools and testing devices and personal protective equipment (PPE) currently used in industry
- applicable documentation including workplace procedures, safe work methods, verification dossier for the site and planning and/or design documentation specifying:
 - Ex ‘d’, Ex ‘e’, Ex ‘i’ and Ex ‘t’ equipment to be installed
 - cables and cable enclosures to be installed
 - cable glands, seals and conductor terminations.

Links

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