

Title	Maintain electrical equipment associated with explosive atmospheres		
Level	4	Credits	6

Purpose	<p>This unit standard is intended for use in the training and assessment of people who work with electrical equipment in explosive atmospheres.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – prepare to carry out maintenance of electrical equipment associated with explosive atmospheres – carry out maintenance of electrical equipment associated with explosive atmospheres, and – complete maintenance work and documentation.
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Classification	Explosive Atmospheres > Electrical Apparatus in Explosive Atmospheres - Operations
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Available grade	Achieved
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Guidance Information

- 1 This unit standard has been designed for training and assessment on-job or off-job in a simulated environment, which includes explosion-protected equipment and wiring systems similar to those encountered in a real workplace. It is recommended candidates achieve Unit 26741, *Demonstrate underpinning knowledge of gas detection equipment in explosive atmospheres*, or demonstrate equivalent skills and knowledge, prior to enrolment in this unit standard.
- 2 This unit standard is equivalent to *Maintain electrical equipment associated with hazardous areas*, in the Australian/New Zealand Standard AS/NZS 4761.1 (version as cited in the Electricity (Safety) Regulations), *Competencies for working with electrical equipment for hazardous areas (EEHA) – Competency Standards*.
- 3 Achievement of this unit standard alone does not entitle trainees to legally perform prescribed electrical work without supervision. Until registered and licensed under the Electricity Act 1992, trainees are assisting, and must work under supervision when carrying out prescribed electrical work.
- 4 Competence is to be demonstrated in relation to any classified explosive atmospheres and explosion-protection techniques. Where the competency is demonstrated on wiring, cabling and equipment that operate at extra low voltage and low voltage, registration with the Electrical Workers Registration Board is required. For work on wiring and equipment operating above 1000 V AC or 1500 V DC, and for underground mines 1200 V AC or 1500 V DC, competency in high voltage work must be held.

5 References

- AS/NZS 1768:2007, *Lightning protection*
- AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- AS/NZS 4761.1 (version as cited in the Electricity (Safety) Regulations), *Competencies for working with electrical equipment for hazardous areas (EEHA) - Competency Standards*
- AS/NZS 60079.14 (version as cited in the Electricity (Safety) Regulations), *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*
- AS/NZS 60079.17 (version as cited in the Electricity (Safety) Regulations), *Explosive atmospheres – Part 17: Electrical installations inspection and maintenance*
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health and Safety at Work Act 2015, and associated regulations
- *Workplace Exposure Standards and Biological Exposure Indices Edition 13*, available from WorkSafe New Zealand www.worksafe.govt.nz/, and associated regulations

and all subsequent amendments and replacements.

6 Definitions

Appropriate personnel – individuals with responsibilities for co-ordination, design, installation, maintenance, production, or servicing activities. This can include: site managers, project managers, engineers and technicians, technical experts, line managers or supervisors, regulatory personnel, team leaders, other personnel designated by an organisation or enterprise.

Certification documentation – document(s) that assure(s) the conformity of a product, process, system, person, or organisation with specified requirements.

Explosion-protected equipment – electrical equipment to which one or more explosion-protection techniques are applied to avoid ignition of a surrounding explosive atmosphere.

Explosion-protection techniques – techniques applied to the design of electrical equipment, components, and systems to prevent electrical energy from becoming an ignition source in the presence of a surrounding explosive atmosphere.

Explosive atmosphere – mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, dust, fibres, or flyings which, after ignition, permits self-sustaining propagation.

Hazardous area – a three-dimensional region or space in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation, and use of equipment.

Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000.

Verification dossier – a set of documents showing the complete compliance history of electrical equipment and installations within explosive atmospheres, as defined in Standards.

Wiring system – permitted wiring and accessories for power, measurement, control or communications purposes.

7 On-job assessment

For on-job assessment each candidate shall have access to:

- a verification dossier for the site including;
 - i design documentation
 - ii area classification drawings
 - iii certification documents for each item of equipment
 - iv inspection records
 - v maintenance records
- b explosive atmosphere equipment, installation and inspection Standards
- c compliant and safe tools and testing devices
- d an assessor.

8 Off-job simulated work environment assessment

For a simulated work environment each candidate shall have access to:

- a an area designated as an explosive atmosphere area which is a close facsimile of a real work environment
- b an area entry point
- c delineation of the area into zones for both gas and dust
- d a person to act as the authorised person for the site
- e a qualified supervisor
- f an assessor.

9 Range

- a Assessment is to take account of variations between the industry sectors and enterprises. For example, equipment used in dust-explosive atmospheres will be different in some respects from that used in a petrochemical plant.
- b Established maintenance procedures must be followed.
- c Candidates must refer to current legislation and Standards during assessment.
- d Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- e All activities and evidence presented for all outcomes and evidence requirements in this unit standard must be in accordance with:
 - i legislation
 - ii workplace policies and procedures
 - iii Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010
 - iv applicable site, enterprise, and industry practice, and,
 - v manufacturers' instructions, specifications, and data sheets.
- f Evidence for the number and type of installations chosen is left to the discretion of the assessor. However, to ensure the candidate's competency it is expected that evidence of a minimum of five different explosion-protection techniques be presented as evidence, covering a range of small, medium and large explosive atmosphere installations.

Outcomes and performance criteria

Outcome 1

Prepare to carry out maintenance of electrical equipment associated with explosive atmospheres.

Performance criteria

- 1.1 Ascertain the area classification and details of explosion-protected equipment and wiring from explosive atmospheres zone drawings and equipment certification documents held in the verification dossier.
- 1.2 Establish the extent of remedial maintenance to be conducted from regulatory requirements and/or inspection records held in the verification dossier.
- 1.3 Evaluate the extent of breakdown maintenance requirements and confirm with personnel reporting a breakdown.
- 1.4 Consult technical management personnel to determine the limits of breakdown maintenance that can be carried out in situ with regard to explosion risk.
- 1.5 Obtain compliant tools, equipment, and testing devices needed to carry out the installation work and check them for correct operation and safety.

Outcome 2

Carry out maintenance of electrical equipment associated with explosive atmospheres.

Performance criteria

- 2.1 Describe the requirements and limitations of scheduled and breakdown remedial maintenance requirements including safe work methods.
- 2.2 Carry out work as specified in the inspection records.
- 2.3 Adjust and maintain equipment within the limits permitted by the equipment certification and in accordance with manufacturers' instructions.
- 2.4 Sight certification documentation for like-for-like replacement parts to ensure compliance with the equipment certification and manufacturers' instructions.
- 2.5 Terminate and isolate circuits of equipment being withdrawn from service safely in accordance with maintenance Standards.
- 2.6 Examine flexible cables and cords and remove from service if they are not in immediate use or are found to be defective or damaged.
- 2.7 Maintain spare equipment, flexible cables, and cords and store them where they are not likely to suffer deterioration or damage.

Outcome 3

Complete maintenance work and documentation.

Performance criteria

- 3.1 Make arrangements in accordance with maintenance Standards and regulatory requirements for a detailed inspection of the maintenance work.
- 3.2 Take action to rectify non-conformances maintenance defects found during the detailed inspection of the work subject to the maintenance.
- 3.3 Record safety assessment for isolation of equipment in accordance with maintenance Standards.
- 3.4 Document completed maintenance work in accordance with requirements and forward it to appropriate personnel for inclusion in the verification dossier.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	29 August 2000	30 June 2012
Review	2	20 May 2011	31 December 2021
Review	3	16 March 2017	31 December 2025
Review	4	2 March 2023	N/A

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council qualifications@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.