Title	**Conduct detailed inspection of electrical installations for explosive atmospheres**		
Level	**5**	**Credits**	**5**

Purpose	People credited with this unit standard are able to: – demonstrate knowledge of techniques used to inspect installations of explosion-protected and associated equipment and wiring systems – demonstrate knowledge of modifications to explosion-protected equipment – prepare for inspection – conduct inspection – record results of detailed inspection.

Classification	Explosive Atmospheres > Electrical Apparatus in Explosive Atmospheres - Compliance

Available grade	Achieved

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 17056, *Install explosion-protected equipment and associated equipment and wiring systems*, and Unit 17058, *Maintain electrical equipment associated with explosive atmospheres*, or demonstrate equivalent knowledge and skills, prior to enrolment in this unit standard.

2 This unit standard is equivalent to *Conduct detailed inspection of electrical installations for hazardous areas*, in the Australian/New Zealand Standard AS/NZS 4761.1 (version 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 cited in the Electricity (Safety) Regulations), *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- AS/NZS 4761.1 (version cited in the Electricity (Safety) Regulations) *Competencies for working with electrical equipment in hazardous areas* (*EEHA*) - *Competency Standards*
- AS/NZS 60079.14 (version cited in the Electricity (Safety) Regulations), *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*
- AS/NZS 60079.17 (version 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 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.

Competent person – a person who can demonstrate a combination of knowledge and skills to effectively, efficiently, and safely carry out activities in explosive atmospheres covered by AS/NZS 4761.1. Competency in some cases may be limited to one or more specific types of explosion-protection technique, e.g. Ex ‘d’, Ex ‘i’, and/or activity e.g. design, selection, installation, maintenance, testing and inspection.

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.
Visual inspection – inspection which identifies, without the use of access equipment or tools, those defects, such as missing bolts, which will be apparent to the eye.
Wiring system – permitted wiring and accessories for power, measurement, control or communications purposes.

7 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.

8 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.

9 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.

10 Range
- a Established maintenance procedures must be followed.
- b Candidates must refer to current legislation and Standards during assessment.
- c Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- d All activities and evidence presented for all outcomes and performance criteria 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
  - v manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of techniques used to inspect installations of explosion-protected and associated equipment and wiring systems.

Performance criteria

1.1 Describe the relationship between the documentation held in a verification dossier and the installed equipment.

Range consistency between the location and type of equipment with the area classification details in the verification dossier, equipment certification and any attached conditions that relate to the equipment as it is installed.

1.2 Explain grades of inspection and how and when they should be applied.

Range close, detailed, visual.

1.3 Explain the requirements for the inspection of a hazardous area installation.

Range inspection processes, requirements applicable to a given installation, inspection report.

Outcome 2

Demonstrate knowledge of modifications to explosion-protected equipment.

Performance criteria

2.1 Describe the scope and limitations for design and development of permitted modifications of explosion-protected equipment.

2.2 Explain the requirements of a competent person for a registered workshop engaged in design and development of modifications to explosion-protected equipment.

2.3 Describe the requirements for identifying and documenting modified explosion-protected equipment.

Range modification report document, requirements for distribution of reports on modifications.

Outcome 3

Prepare for inspection.

Performance criteria

3.1 Ascertain the classification of the area from explosive atmospheres layout drawings retained in the verification dossier.

3.2 Ascertain the type and grade of inspection from the inspection schedule retained in the verification dossier.

3.3 Determine the classification details and specified location of each item of equipment and circuits subject to inspection from design drawings and equipment certification documentation retained in the verification dossier.

3.4 Obtain special tools, equipment, and testing devices needed for the inspection are obtained and check them for correct operation and safety and rectify or replace any defective items.

Outcome 4

Conduct inspection.

Performance criteria

4.1 Inspect equipment, systems, and installation for compliance with the design specifications retained in the verification dossier and in accordance with the inspection schedule and Standards.

4.2 Where applicable in a given jurisdiction, direct an appropriately qualified person to remove equipment enclosure covers and internal components where needed to enable inspection.

4.3 Make arrangements to store and protect equipment covers and components that are removed to enable inspection.

4.4 Where applicable in a given jurisdiction, after the inspection of each item, direct an appropriately qualified person to replace components and equipment covers in a manner that ensures the integrity of the explosion-protection system.

Outcome 5

Record detailed inspection results in accordance with inspection Standards.

Performance criteria

5.1 Record the results of an inspection.

5.2 Record defects such as equipment deterioration, faults, and unauthorised modifications.

5.3 Specify actions to rectify defects in the inspection record.

5.4 Forward the inspection record to the appropriate personnel for inclusion in the verification dossier.

Replacement information	This unit standard replaced unit standard 17075.

Planned review date	31 December 2027

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	16 March 2017	31 December 2025
Review	2	2 March 2023	N/A

Consent and Moderation Requirements (CMR) reference	0003

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.