Title	**Determine the explosion-protection requirements specified for classified explosive atmospheres**		
Level	**4**	**Credits**	**5**

Purpose	This unit standard is intended for use in the training and assessment of people who work with electrical equipment in explosive atmospheres. People credited with this unit standard are able to: – prepare to review explosion-protected technical Standards – ascertain the requirements for each explosion-protection type – identify acceptable equipment certification for a given site.

Classification	Explosive Atmospheres > Electrical Apparatus in Explosive Atmospheres - Operations

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 26740, *Demonstrate and apply intermediate underpinning knowledge of electrical equipment in explosive atmospheres*, or demonstrate equivalent knowledge and skills, prior to enrolment in this unit standard.

2 This unit standard is equivalent to *Determine the explosion protection requirements specified for a classified hazardous area*, in AS/NZS 4761.1 (version as cited in the Electricity (Safety) Regulations), *Competencies for working with electrical equipment in hazardous areas* (*EEHA*) and covers the practical component. Please refer to unit standard 26739, *Demonstrate introductory underpinning knowledge of electrical equipment in explosive atmospheres*, for the theoretical component.

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 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 in hazardous areas* (*EEHA*) *– Part 1: Competency Standards*
- AS/NZS 60079.14 (version as cited in the Electricity (Safety) Regulations), *Explosive atmospheres - Electrical installations design, selection and erection*
- AS/NZS 60079.17 (version as cited in the Electricity (Safety) Regulations), *Explosive atmospheres Electrical installations inspection and maintenance*;
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health and Safety at Work Act 2015, and associated regulations

and their subsequent amendments and replacements.

5 Definitions

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, as follows:

For Gas and Vapour Atmospheres

Ex d – flameproof;

Ex e – increased safety;

Ex i – intrinsic safety; with levels of protection Ex ia, Ex ib, and Ex ic;

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 (version as cited in the Electricity (Safety) Regulations), *Electrical Installations (known as the Australian/New Zealand Wiring Rules).*

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

6 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.

7 On-job assessment
For on-job assessment each candidate shall have access to:
- a plan of the site showing delineation of classified zones
- b list of signage used on the site
- c limitations of devices and equipment that may be taken into the area
- d limitations of work that may be undertaken in the area
- e procedures and instruction in the case of an emergency
- f an entry and clearance-to-work system
- g examples of typical devices and equipment (compliant and non-compliant) that a person may take into an explosive atmosphere area, this may include cellular phones, testing devices and equipment, and tools
- h 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, 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 Candidates must refer to current legislation and Standards during assessment.
- b Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- c All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
  - i legislation
  - ii policies and procedures
  - iii ethical codes
  - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010
  - v applicable site, enterprise, and industry practice
  - vi manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Prepare to review explosion-protected technical Standards.

Performance criteria

1.1 Identify the technical Standards specifying the requirements to which each type of explosion-protected equipment shall comply.

1.2 Review a verification dossier for a site that has gas hazards and establish the requirements for the explosive atmospheres.

1.3 Review a verification dossier for a site that has dust hazards and establish the requirements for the explosive atmospheres.

Outcome 2

Ascertain the requirements for each explosion-protection type.

Range exclusion, explosion containment, avoidance of ignition source, dilution, ventilation.

Performance criteria

2.1 Explain explosion-protection methods for different equipment types and describe their protective features and principle of operation.

2.2 Review the equipment Standards to establish the compliance requirements of each equipment type.

2.3 Describe aspects that can void the protection of explosion-protection equipment due to defective installation or poor maintenance for different equipment types and equipment Standards.

2.4 Examine items of explosion-protected equipment to identify any condition that would void the protection.

Range Ex d, Ex e, Ex i.

2.5 Use technical Standards, equipment certification, and the verification dossier for a given site to establish where particular explosion-protected equipment types may be used.

Outcome 3

Identify acceptable equipment certification for a given site.

Performance criteria

3.1 Use equipment certification process and acceptable Standards to identify acceptable equipment certification.

3.2 Obtain the required marking on certified equipment from relevant technical Standards.

3.3 Establish the suitability of explosion-protection equipment items for a given application and location from relevant technical Standards, certification documents, equipment marking, and the verification dossier for a given site.

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.