Title	**Report on the integrity of explosion-protected electrical apparatus in explosive atmospheres**		
Level	**3**	**Credits**	**3**

Purpose	This unit standard is intended for people who are responsible for plant operation, maintenance, and inspections. People credited with this unit standard are able to: – demonstrate knowledge of visible conditions of explosion-protected apparatus that indicate the protection is void, and changes in the nature of the explosion hazardous environment that may render the explosion-protection unsafe – prepare to work in a hazardous area – observe and document condition of explosion-protected system area, and – take actions to limit the risks of an explosion.

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 apparatus and wiring systems similar to those encountered in a real workplace. It is recommended candidates achieve Unit 26739, *Demonstrate introductory underpinning knowledge of electrical equipment in explosive atmospheres* and Unit 26740, *Demonstrate and apply intermediate underpinning knowledge of electrical equipment in explosive atmospheres*, or demonstrate equivalent skills and knowledge, prior to enrolment in this unit standard.

2 This unit standard is intended to be assessed against in conjunction with other work skills related to operation, installation, maintenance, or servicing of plant or machinery in explosive atmospheres at NZQF Level 3 or above.

3 Competence is to be demonstrated in relation to any classified hazardous areas.

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 for hazardous areas (EEHA) – Part 1: Competency Standards*
- AS/NZS IEC 60079.10.1:2022*, Explosive atmospheres, Part 10.1: Classification of areas – Explosive gas atmospheres*
- 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*
- AS/NZS 60079.29.2 (version as cited in the Electricity (Safety) Regulations)*, Explosive atmospheres – Part 29.2: Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen*
- 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.

5 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.

Defects – visual damage or corrosion of the explosion-protection aspect of the installation or apparatus.

Established procedures – formal documented arrangements of an organisation, enterprise or statutory authority in regard to how work is to be done and by whom and may include but are not limited to – quality management systems, safety management systems, work clearance systems, work instructions, reporting systems, and arrangements for dealing with emergencies.

Explosion-protection techniques – techniques applied to the design of electrical apparatus, components, and systems to prevent the electrical energy from becoming an ignition source in the presence of flammable vapours and gases or combustible dusts in explosive atmospheres. See *Explosion-protected apparatus*.

Explosion-protected apparatus – electrical apparatus to which specific measures are applied to avoid ignition of a surrounding explosive atmosphere.

Explosive atmosphere – an atmosphere comprising volatile substances mixed with air under atmospheric conditions in the form of gases, vapours, mist, or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

Hazardous area – area 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 apparatus.

Integrity of explosion-protected apparatus – the condition of being unified, complete or sound in construction of the apparatus design and use that ensures explosion-protection, for example, the structural integrity of the apparatus.
Visual inspection – inspection which identifies, without the use of access apparatus or tools, those defects, such as missing bolts, which will be apparent to the eye.
Verification dossier – a set of documents showing the complete compliance history of electrical apparatus and installations within hazardous areas, as defined in Standards.
Wiring system – permitted wiring and accessories for power, measurement, control or communications purposes.

6 Range

a Assessment is to take account of variations between the industry sectors and enterprises. For example, apparatus used in dust-explosive atmospheres will be different in some respects from that used in a petrochemical plant.

b Health and safety policies and procedures may include but are not limited to – work permits and clearances, hazard monitoring, evacuation procedures, plant and electrical isolation.

c The application of contingency management skills must be demonstrated for all outcomes and performance criteria.

d Established maintenance procedures must be followed.

e All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with safe working principles and practices, legislation, workplace policies and procedures, Standards, safe and sound practice, and industry practice; and, where appropriate, manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of visible conditions of explosion-protected apparatus that indicate the protection is void, and changes in the nature of the explosion hazardous environment that may render the explosion-protection unsafe.

Performance criteria

1.1 Describe visible defects that can be expected in explosion-protected apparatus and wiring.

1.2 Identify conditions that may indicate a change in a given explosion hazard.

1.3 Explain procedures to be followed in the event of a change in the explosion hazard.

Outcome 2

Prepare to work in a hazardous area.

Performance criteria

2.1 Describe health and safety procedures to be followed before entering an explosive atmospheres environment and while conducting visual inspection.

2.2 Identify the nature of the explosion hazard(s) in the area and risks, and ascertain the status of the explosion hazard through established procedures.

2.3 Ascertain the operation and condition of plant and machinery, with regard to explosion-protection, through established procedures.

2.4 Follow established procedures for use of the plant and machinery, with regard to explosion-protection techniques used in the area.

Range identification of visual damage or deterioration of explosive-protected apparatus, plant, and machinery operation, examination of apparatus certificate to determine any special installation requirements.

Outcome 3

Observe and document condition of explosion-protected system area.

Performance criteria

3.1 Monitor the performance of plant and machinery to identify faults that may affect the integrity of the explosion-protected apparatus and wiring system.

3.2 Inspect explosion-protected apparatus and wiring during normal operations and identify visual non-conformances that may affect the integrity of the explosion-protection technique.

Range includes – integrity of earthing systems, integrity of installation to apparatus certificate.

3.3 Observe operation of explosion hazard monitoring apparatus and identify any dangerous state of the hazard.

3.4 Report variations outside normal operating conditions to appropriate personnel where relevant and document them in accordance with established procedures.

Range reporting includes but is not limited to – appropriate personnel, verification dossier.

3.5 Describe the purpose and methods of reporting defects in explosion-protected apparatus and wiring.

Outcome 4

Take actions to limit the risk of an explosion.

Range actions may include but are not limited to established procedures for – reporting and rectifying defects, shutting down plant or machinery under emergency conditions, plant and electrical isolation procedures, evacuating a hazardous area, reporting defects and conditions of plant and machinery, monitoring the hazardous area for presence of an explosive atmosphere, meeting health and safety obligations;
defects may include – visual damage and corrosion of apparatus and wiring, loose fasteners, missing fasteners.

Performance criteria

4.1 Follow established procedures in the event of a potential or immediate hazardous condition arising from any non-conformance identified in apparatus and/or wiring, or changes in the explosion hazard to a dangerous state.

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	29 August 2000	28 February 2023
Revision	2	3 April 2001	28 February 2023
Review	3	20 May 2011	31 December 2025
Review	4	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.