Title Conduct a conformity assessment of explosion-protected apparatus

Level 6

Credits 9

Purpose

This unit standard covers the assessment and certification of explosion-protected apparatus with a certificate of conformity other than an IECEx, ATEX, ANZEx or AUSEx Certificates, and producing a conformity assessment document. It encompasses skills and knowledge to examine and compare document content, compare requirements of IEC or AS/NZS Standards with alternative Standards on which the original certification was based, knowledge of explosion-protection techniques, and technical report writing.

This unit standard is for electrical engineers and inspectors who are responsible for the design, selection, or inspection of explosion-protected electrical apparatus for use in hazardous areas.

People credited with this unit standard are able to:
- demonstrate knowledge of the documentation used in assessing explosion-protected apparatus for conformance to accepted Standards;
- demonstrate knowledge of the processes used in assessing explosion-protected apparatus for conformance to accepted Standards;
- prepare to conduct conformity assessment;
- conduct conformity assessment; and
- document and submit conformity assessment report.

Classification

Explosive Atmospheres > Electrical Apparatus in Explosive Atmospheres - Compliance

Available grade

Achieved

Entry information

Critical health and safety prerequisites

Unit 26740, *Demonstrate and apply intermediate underpinning knowledge of electrical apparatus in explosive atmospheres*, or demonstrate equivalent knowledge and skills.

Candidates must be an Electrical Inspector holding current registration and a practising license with the Electrical Workers Registration Board (EWRB).
**Explanatory notes**

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.

2. It is recommended that candidates undertaking this unit standard be working towards achievement of the National Certificate in Electrical Apparatus in Explosive Atmospheres (Level 4) [Ref: 1671].

3. Candidates who achieve this unit standard will be given industry endorsement for explosion-protection techniques relating to one or more of: mining, gases or dusts, depending on which explosion-protection technique competence is demonstrated. The explosion-protection endorsements are as follows:

<table>
<thead>
<tr>
<th>Unit endorsement suffix</th>
<th>Competence demonstrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex ‘d’</td>
<td>Flameproof</td>
</tr>
<tr>
<td>Ex ‘e’</td>
<td>Increased safety</td>
</tr>
<tr>
<td>Ex ‘n’</td>
<td>Non-sparking</td>
</tr>
<tr>
<td>Ex ‘i’</td>
<td>Intrinsic safety</td>
</tr>
<tr>
<td>Ex ‘p’</td>
<td>Pressurization</td>
</tr>
<tr>
<td>Ex ‘tD’ (DIP)</td>
<td>Protection by enclosure – dusts</td>
</tr>
<tr>
<td>‘I’</td>
<td>Group I apparatus only</td>
</tr>
<tr>
<td>‘Gases’</td>
<td>Gas hazards only</td>
</tr>
<tr>
<td>‘Dusts’</td>
<td>Dust hazards only</td>
</tr>
<tr>
<td>‘ELV’</td>
<td>For apparatus and systems operating at extra-low voltage.</td>
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</tbody>
</table>

For further detail about the explosion-protection endorsements, please contact ETITO at [http://www.etito.co.nz](http://www.etito.co.nz).

4. This unit standard is directly equivalent to Unit 2.9 Conduct a conformity assessment of explosion-protected equipment in the Australian/New Zealand Standard AS/NZS 4761.1:2008 Competencies for working with electrical equipment in hazardous areas (EEHA) Part 1: Competency standards and includes essential skills and knowledge as specified in the relevant clauses. It aligns with Australian Competency Standards UEEENEEM035A, UEEENEEM036A and UEEENEEM037A from UEE07 Electrotechnology Training Package Version 3.1 (copyright Australian National Training Information Service).

5. This unit standard is intended to be assessed against in conjunction with other work skills related to compliance assessment of electrical/electronic apparatus and general technical evaluation and report writing at NZQF Level 5 or above.

6. Competence is to be demonstrated in relation to any classified hazardous areas and explosion-protection technique. A copy of a candidate’s current practising licence must be presented at the time of assessment.

7. References
   - AS/NZS 1768:2007, Lightning protection;
   - AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules);
   - AS/NZS 4761.1:2008, Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1 – Competency Standards;
AS/NZS 60079.10.1:2009, Explosive atmospheres – Classification of areas – Explosive gas atmospheres;
AS/NZS 60079.14:2009, Explosive atmospheres – electrical installations design, selection, and erection;
AS/NZS 60079.17:2009, Explosive atmospheres – electrical installations inspection and maintenance;
AS/NZS 60079.29.2:2008, Explosive atmospheres – Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen;
AS/NZS 61241.0:2005, Electrical apparatus for use in the presence of combustible dust – General requirements;
AS/NZS 61241.2.1:2000, Electrical apparatus for use in the presence of combustible dust – Test methods – Methods for determining the minimum ignition temperature of dust;
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Hazardous Substances and New Organisms Act 1996;
Health and Safety in Employment Act 1992, and associated regulations;
New Zealand Electrical Codes of Practice (NZECP), ISSN 0114-0663 (available from the Ministry of Economic Development);
Standards Australia HB13-2007, Electrical equipment for hazardous areas;
and all subsequent amendments and replacements.

8 Definitions

ANZEx – Australian/New Zealand Certification Scheme for explosion-protected electrical equipment.
ATEX – derived from French title of the 94/9/EC directive: Appareils destinés à être utilisés en ATmosphères EXplosibles.
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.
AUSEx – Electrical equipment in hazardous areas Australian certification scheme.
Certification documentation – document(s) that assure(s) the conformity of a product, process, system, person, or organisation with specified requirements.
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. Such apparatus employs one or more of the following explosion-protection techniques:

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;
- Ex n – non-sparking;

For dusts
- Ex iD – intrinsic safety (dusts);
- Ex tD – enclosed;

Others, less common
- Ex p – pressurisation; Ex pD (dust);
- Ex m – encapsulation, with levels of protection Ex ma, Ex mb, Ex mc (gases and vapours), and Ex mD (dusts);
- Ex s – special protection; categorised by Zone of application; e.g. 'Ex s (Zone 0);
- Ex o – oil immersion;
- Ex q – sand filled;
- Ex v – ventilation.

**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.

**IEC** – International Electrotechnical Commission, the international standards and conformity assessment body for all fields of electrotechnology.

**IECEx** – IEC system for certification to standards relating to equipment for use in explosive atmospheres.

**Verification dossier** – a set of documents showing the complete compliance history of electrical apparatus and installations within hazardous areas, as defined in Standards.

### 9 Range

- **a** Assessment is to take account of variations between the industry sectors and enterprises. For example, apparatus used in underground coal mining will be different in some respects from that used in a petrochemical plant.
- **b** Occupational Safety and Health (OSH) 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 evidence requirements.
- **d** Established maintenance procedures must be followed.
- **e** All activities and evidence presented for all outcomes and evidence requirements in this unit standard must be in accordance with safe working principles and practices, legislation, policies, procedures, ethical codes and Standards, safe and sound practice, and industry practice; and, where appropriate, manufacturers’ instructions, specifications, and data sheets.
Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of the documentation used in assessing explosion-protected apparatus for conformance with accepted Standards.

Evidence requirements

1.1 Documentation and Standard(s) required to begin an assessment are identified.

1.2 Differences between the test requirements of Standards from other countries and the compliant/acceptable Standards against which the apparatus is being assessed are identified.

1.3 Results given in apparatus test reports are explained.

Outcome 2

Demonstrate knowledge of the processes used in assessing explosion-protected apparatus for conformance to accepted Standards.

Evidence requirements

2.1 Conformity assessment processes and procedures are explained.

2.2 Processes and procedures for assessing previously certified explosion-protected apparatus to current acceptable Standards is described, and possible outcomes are identified.

2.3 A clause-by-clause assessment between the apparatus manufacturing Standards and the current acceptable Ex Standards are described in terms of processes and procedures used and differences between the Standards that may be detected.

Outcome 3

Prepare to conduct conformity assessment.

Evidence requirements

3.1 Certification documentation is obtained and read to determine the certification specifications for which the apparatus has been assessed.

3.2 Relevant Standards required to begin the conformity assessment are obtained in accordance with established procedures.

3.3 OSH policies and procedures are followed where a site inspection is required to identify apparatus that is already installed and is subject to the conformity assessment.
Outcome 4

Conduct conformity assessment.

Evidence requirements

4.1 Conformity assessment is carried out in accordance with OSH and other established procedures.

4.2 Knowledge of all Standards to be used including IEC, ATEX or AS/NZS Standards is applied to a detailed comparison with alternative Standards on which original certification is based.

4.3 The documented certification criteria of the apparatus are compared to those required by currently acceptable Standards, including any test on which the certification is based.

4.4 Discrepancies between the certification documentation and IEC, ATEX, AUSEx or AS/NZS Standards are identified and actions needed to correctly address each of these are recorded.

Outcome 5

Document and submit conformity assessment report.

Evidence requirements

5.1 Conformity assessment results are documented in a conformity assessment document, which informs whether the apparatus provides an ‘equivalent level of safety’ to be installed, maintained, overhauled/repaired, and used safely within a hazardous area.

5.2 Recommendations for corrective actions to address discrepancies are included in the conformity assessment document.

5.3 Conformity assessment document is forwarded to appropriate personnel in accordance with established procedures for inclusion in the verification dossier.

<table>
<thead>
<tr>
<th>Planned review date</th>
<th>31 December 2016</th>
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<p>| Status information and last date for assessment for superseded versions |
|-----------------------------|------------------|-------------------|--------------------------|</p>
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<th>Version</th>
<th>Date</th>
<th>Last Date for Assessment</th>
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<td>Registration</td>
<td>1</td>
<td>29 August 2000</td>
<td>30 June 2012</td>
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<tr>
<td>Review</td>
<td>2</td>
<td>17 June 2011</td>
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Consent and Moderation Requirements (CMR) reference 0003

Please note
Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact the ElectroTechnology Industry Training Organisation (ETITO) reviewcomments@etito.co.nz if you wish to suggest changes to the content of this unit standard.