Title	**Carry out overhaul and repair of explosion-protected apparatus**		
Level	**4**	**Credits**	**2**

Purpose	This unit standard covers the explosion-protection aspects of overhauling and repairing explosion-protected apparatus at a craftsperson level. It requires the ability to identify and select authorised components, follow repair specifications to effect the overhauled and repaired apparatus and complete repair documentation. This unit standard is intended for electricians, electronic technicians, and/or mechanics responsible for the repair of explosion-protected apparatus. People credited with this unit standard are able to: – prepare for overhaul and repair of apparatus; – carry out the overhaul and repair work; and – document overhaul and repair work.

Classification	Explosive Atmospheres > Electrical Apparatus in Explosive Atmospheres - Operations

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.

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 This unit standard is directly equivalent to Unit 2.20 *Carry out overhaul and repair 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 Standard *UEENEEM060A* from UEE07 Electrotechnology Training Package Version 3.1 (copyright Australian National Training Information Service).

3 This unit standard is intended to be assessed against in conjunction with other work skills related to servicing of plant or machinery in explosive atmospheres.

4 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 4761.2:2008, *Competencies for working with electrical equipment for hazardous areas (EEHA) Part 2 – Guide to assessing competenc*y;
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 61241.14:2005, *Electrical apparatus for use in the presence of combustible dust – Selection and installation*;
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;
Standards Australia HB13-2007, *Electrical equipment for hazardous areas*;
Workplace Exposure Standards and Biological Exposure Indices, available from the Department of Labour, and associated regulations;
and their subsequent amendments and replacements.

5 Definitions
Certification documentation – document(s) that assure(s) the conformity of a product, process, system, person, or organization 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.
The term *equipment* includes *apparatus*, as mentioned in many relevant Standards.
Responsible person – for the purpose of this unit standard means someone who has achieved Unit 24987, *Establish, arrange and verify overhaul and repair of explosion-protected apparatus,* or has demonstrated equivalent knowledge and skills.

6 Range
a Assessment is 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

Prepare for overhaul and repair of apparatus.

Evidence requirements

1.1 Specifications and instructions for the overhaul and repair work are received and expected outcomes of the work confirmed with the responsible person.

1.2 Apparatus to be overhauled and repaired is identified by its markings and certification documentation.

1.3 Special tools, apparatus and testing devices needed to carry out the overhaul and repair work are obtained and checked for correct operation, safety and currency of calibration certification.

Outcome 2

Carry out the overhaul and repair work.

Evidence requirements

2.1 Specifications and instructions for the overhaul and repair work are followed in accordance with established procedures.

2.2 Replacement parts and components used in the overhaul and repair are identified as being authorised by the apparatus manufacturer.

2.3 Overhaul and repair of apparatus is done in a manner that does not reduce the type of protection afforded by the apparatus design.

2.4 Quality checks are made to ensure that the overhaul and repair of the apparatus complies with the overhaul and repair specifications and instruction.

Outcome 3

Document overhaul and repair work.

Evidence requirements

3.1 Overhaul and repair work carried out is documented in accordance with established procedures.

3.2 The responsible person is notified of the completion of the work in accordance with established procedures.

Planned review date	31 December 2016

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 May 2011	N/A

Consent and Moderation Requirements (CMR) reference	0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

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.