

Title	Demonstrate and apply knowledge of earthing systems, bonding, shrouding, and access control for switchboards		
Level	4	Credits	11

Purpose	<p>This unit standard is for people engaged in the manufacture of switchboards in the electrotechnology industry.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of current regulations applicable to earthing, bonding, and shrouding of switchboards; – install switchboard earthing and bonding systems; – fabricate and install switchboard shrouding; and – demonstrate knowledge of access control for switchboards.
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Classification	Electrical Engineering > Electric Switchboards
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Available grade	Achieved
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Explanatory notes

- 1 This unit standard may be used for learning and assessment on-job.
- 2 References
 Accident Compensation Act 2001;
 AS/NZS 3000:2007, *Electrical installations (known as the Australian/New Zealand Wiring Rules)*;
 AS/NZS 3439.4:2009, *Low-voltage switchgear and control gear assemblies – Particular requirements for assemblies for construction sites (ACS)*;
 Electricity Act 1992;
 Electricity (Safety) Regulations 2010;
 Health and Safety at Work Act 2015;
 The New Zealand Electrical Codes of Practice, available from [WorkSafe New Zealand](#);
 and all subsequent amendments and replacements.
- 3 Definitions
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
IP – Ingress Protection.
Safe and sound practice – this relates to the installation of electrical equipment and is defined in AS/NZS 3000:2007.

Unskilled personnel – means non-ticketed personnel and personnel who are authorised but are not skilled and competent in carrying out an activity.

4 Range

- a Candidates may 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 evidence presented for assessment against 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; and,
 - vi where appropriate manufacturers' instructions, specifications, and data sheets.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of current regulations applicable to earthing, bonding, and shrouding of switchboards.

Evidence requirements

- 1.1 Identify current regulations relevant for earthing, bonding, and shrouding of switchboards.
- 1.2 Explain the roles of earthing, bonding, and shrouding to ensure the electrical safety of a switchboard.

Outcome 2

Install switchboard earthing and bonding systems.

Evidence requirements

- 2.1 Plan and size earth termination points for outgoing circuit connections.
- 2.2 Identify all metal parts of an enclosure that require bonding.
- 2.3 Explain bonding methods or techniques that are used to bond metal parts in terms of conductors, fittings, and fixings.

Range bonding methods for metal parts include but are not limited to – star washers, braided connection.
- 2.4 Install earthing systems and bonding into switchboards.

Outcome 3

Fabricate and install switchboard shrouding.

Evidence requirements

- 3.1 Select suitable shrouding material for the purpose in terms of electrical and mechanical properties and function.
- 3.2 Cut shrouding safely, accurately, and in a cost-effective manner.
- 3.3 Fit and install shrouding to meet job specifications and IP rating requirements.

Outcome 4

Demonstrate knowledge of access control for switchboards.

Evidence requirements

- 4.1 Explain the importance of access control on a switchboard.
- 4.2 Identify areas of the switchboard that are accessible by unskilled personnel, to put measures in place to eliminate or minimise risk of harm.

Replacement information	This unit standard replaced unit standard 14975.
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Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 November 2016	N/A

Consent and Moderation Requirements (CMR) reference	0003
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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 (CMR). 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 Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.