

Title	Demonstrate and apply knowledge of switchboard components and their representation in documentation		
Level	4	Credits	12

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 layout and physical enclosure requirements of switchboards from documentation – demonstrate knowledge of switchgear components excluding cables and busbars – demonstrate knowledge of the function of different cable types used in the manufacture of switchboards – demonstrate knowledge of switchgear busbars – demonstrate knowledge of switchboard drawings – create GA or SLD switchboard schematics using CADD.
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Classification	Electrical Engineering > Electric Switchboards
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Available grade	Achieved
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Guidance Information

1 This unit standard may be used for learning and assessment on-job.

2 Reference

- Accident Compensation Act 2001
- AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- AS/NZS 61439.4:2016, *Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)* available at [Standards NZ](https://standards.nz)
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health and Safety at Work Act 2015
- The New Zealand Electrical Codes of Practice, available at WorkSafe New Zealand, worksafe.govt.nz and all subsequent amendments and replacements.

3 Definitions

CADD – computer aided design and drafting package.

GA – General Assembly.

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

Safe and sound practice – this relates to the installation of electrical equipment and is defined in AS/NZS 3000.

SLD – Single Line Diagram.

Symbols and components – items commonly used in switchboard manufacture and interfacing equipment.

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 For assessment purposes, candidates must demonstrate competence with documentation systems used in their particular workplace. Documentation may include but is not limited to – drawings, manuals, and procedure sheets.
- d 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
 - vi where appropriate manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of layout and physical enclosure requirements of switchboards from documentation.

Performance criteria

- 1.1 Establish size, shape, and layout of the switchboard and explain considerations for selection.
 - Range includes but is not limited to – installation, space, equipment, assembly, thermal characteristics, access to switchboard, entry and exit cables.
- 1.2 Establish material used for switchboard enclosures.
- 1.3 Identify and explain components required to produce a switchboard and discuss hardware configuration.
 - Range may include but is not limited to – arc fault containment, form factor.

Outcome 2

Demonstrate knowledge of switchgear components excluding cables and busbars.

Performance criteria

- 2.1 Identify components and explain their function on a switchboard assembly.
- Range 10 components selected by the candidate and 10 components selected by the assessor.
- 2.2 Provide alternative component symbols with reference to other international standards.
- Range 10 components selected by the candidate and 10 components selected by the assessor.
- 2.3 Explain the function of special component mounting provisions.
- 2.4 Locate and explain circuit connection points on the components.

Outcome 3

Demonstrate knowledge of the function of different cable types used in the manufacture of switchboards.

Performance criteria

- 3.1 Identify and explain the function of five different cable types.
- 3.2 Provide and explain typical applications with reference to the identified five cables.
- 3.3 Explain the purpose and need for cable/core identification.

Outcome 4

Demonstrate knowledge of switchgear busbars.

Performance criteria

- 4.1 Identify and explain two different applications of busbars on a switchboard assembly.
- 4.2 Identify and explain busbar mounting provisions.
- 4.3 Identify and explain busbar connection points, joints, and main entry tabs.

Outcome 5

Demonstrate knowledge of switchboard drawings.

Performance criteria

- 5.1 Identify different types of diagrams and explain unique features and purpose of each type of diagram with reference to a particular application.

Range GA, schematic, SLD, busbar layout.

- 5.2 Identify and explain five component details in each set of diagrams for a particular switchboard.

Range GA, schematic, SLD.

Outcome 6

Create GA or SLD switchboard schematic using CADD.

Performance criteria

- 6.1 Produce two sets of drawings using CADD.
- 6.2 Provide at least five industry recognised symbols per drawing.
- 6.3 Confirm drawing accuracy meets job specifications.

Replacement information	This unit standard replaced unit standard 14970.
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Planned review date	31 December 2026
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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
Rollover and Revision	2	25 July 2024	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>.

Comments on this unit standard

Please contact the 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.