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| **Title** | **Demonstrate knowledge of and operate metal clad switchgear** | | |
| **Level** | **4** | **Credits** | **10** |

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| **Purpose** | People credited with this unit standard are able to: demonstrate knowledge of metal clad switchgear, and the operational status of metal clad switchgear; operate metal clad switchgear; and report on switching actions. |

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| **Classification** | Electricity Supply > Electricity Supply - Core Skills |

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| **Available grade** | Achieved |

**Guidance Information**

1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.

2 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the current version of the Health and Safety at Work Act 2015; Electricity Act 1992; Electricity (Safety) Regulations 2010; and any subsequent amendments and replacements; Electricity supply industry codes of practice and documented enterprise procedures, including *Safety Manual – Electricity Industry* (SM-EI) (2015) available at www.eea.co.nz.

3 Definitions
*Asset owner* refers to a participant who owns or operates assets used for generating or conveying electricity.
*Industry requirements* include all asset owner requirements; manufacturers' specifications; and enterprise requirements which cover the documented workplace policies, procedures, specifications, business, and quality management requirements relevant to the workplace in which assessment is carried out.

## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of metal clad switchgear.

**Performance criteria**

1.1 The function of metal clad switchgear is described in terms of making and breaking flow of current and providing a point of isolation between power cables and bus bar.

1.2 Components of metal clad switchgear are identified.

Range includes but is not limited to – protection and controls, spouts, bus shutters, circuit breaker, voltage transformers, enclosed bus bars, current transformers, cable entry.

1.3 The isolation procedures for an outdoor circuit breaker and indoor metal clad switchgear are described.

1.4 The isolation and construction of metal clad switchgear and gas insulated switchgear (GIS) are described.

1.5 Types of isolation methods for metal clad switchgear are described in terms of horizontal isolation, vertical isolation, and fixed type.

**Outcome 2**

Demonstrate knowledge of the operational status of metal clad switchgear.

**Performance criteria**

2.1 Equipment status is determined to check it is safe to carry out the intended operation in accordance with established procedures and instructions.

Range includes but is not limited to – indications, alarms, operations count, protection operations, number of fault breaks.

2.2 The isolation principles associated with metal clad switchgear are described in terms of racking in and racking out.

**Outcome 3**

Operate metal clad switchgear.

Range open, close, protection tripping, isolate, local and remote operation, indications, alarms, control fuses, rack in, rack out.

**Performance criteria**

3.1 Switching plans to operate equipment are developed and checked by authorised personnel.

3.2 Equipment to be operated is confirmed as the same as the intended operation in the instruction.

Range includes but is not limited to – single line diagram, relay diagram, switchgear type, operating notes.

3.3 The equipment is operated in accordance with established procedures and instructions.

Range includes but is not limited to – switchboard or substation layout, locking system, manufacturer's operating manual and specifications.

3.4 Operating decisions are actioned in accordance with equipment status and operating requirements.

Range includes but is not limited to – plant availability and service condition, loading limits, impact, options, alternatives.

3.5 Equipment is operated in sequence and in accordance with schedules and workplace procedures within defined plant capabilities.

Range switching capability, switching plan.

3.6 Plant and equipment are monitored.

Range includes but is not limited to – current loading, status, alarms, defects, action confirmation.

3.7 Isolations are confirmed by electrical testing.

Range includes but is not limited to – bus bars, power cables.

3.8 Earths are applied to equipment.

Range includes but is not limited to – bus bars, power cables.

3.9 Secondary circuits are isolated.

Range includes but is not limited to – voltage transformer, locking pins, fuses removed.

**Outcome 4**

Report on switching actions.

Range includes but is not limited to – operating log, service report, work report, hazard identification.

**Performance criteria**

4.1 Information is recorded in a concise and legible manner.

4.2 Information is recorded in the required asset owner's format.

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| **Planned review date** | 31 December 2025 |

**Status information and last date for assessment for superseded versions**

| Process | Version | Date | Last Date for Assessment |
|---|---|---|---|
| Registration | 1 | 22 October 2003 | 31 December 2013 |
| Rollover and Revision | 2 | 20 June 2008 | 31 December 2013 |
| Review | 3 | 9 December 2010 | 31 December 2019 |
| Review | 4 | 16 March 2017 | 31 December 2022 |
| Review | 5 | 27 August 2020 | N/A |

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| **Consent and Moderation Requirements (CMR) reference** | 0120 |

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

**Comments on this unit standard**

Please contact Connexis - Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.