Title	**Use SCADA to manage the power system**		
Level	**4**	**Credits**	**5**

Purpose	People credited with this unit standard are able to: describe SCADA and how it is used to manage the power system; describe a SCADA system database; demonstrate the use of SCADA Man Machine Interface (MMI) and full graphics environment in managing the power system; describe the operational modes available in SCADA to manage the power system; manage the power system using basic SCADA control functions; and manage power system alarms.

Classification	Electricity Supply > Electricity Supply - Power System Management

Available grade	Achieved

Guidance Information

1 Safety of personnel and plant must be a priority throughout the assessment. If the safety requirements are not met the assessment must stop.

2 Performance and work practices in relation to the outcomes and performance criteria must comply with:
- all current legislation, especially the Electricity Act 1992 and any subsequent amendments, as well as any regulations, codes of practice recognised under that statute;
- Health and Safety at Work Act 2015, the Resource Management Act 1991, and their subsequent amendments;
- electricity supply industry codes of practice and documented enterprise procedures. These include updated versions of *Safety Manual – Electricity Industry* (SM-EI) Wellington: Electricity Engineers' Association available from https://www.eea.co.nz/.

3 Evidence presented for assessment against this unit standard must be in accordance with applicable industry requirements, company and legislative requirements

4 The following terms and abbreviations relate to this unit standard:
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.
Data refers to information in a written or numerical form. The latter may include summary statistics, information in tables, and numbers displayed in a variety of graphs.

SCADA – Supervisory Control and Data Acquisition system, a computer system that is used to operate equipment and monitor the performance of the electrical power system and/or network, gather data for analytical purposes, and generally assist the operation and delivery of electrical network functions concerning the supply of electricity to customers.

Outcomes and performance criteria

Outcome 1

Describe SCADA and how it is used to manage the power system.

Performance criteria

1.1 The main purpose of SCADA in the electricity supply industry is described.

Range may include but is not limited to – monitoring the power system, gathering data, remote control of equipment, processing data, display of data.

1.2 The essential items of SCADA system hardware and their purpose are described.

Range may include but is not limited to – transducers, remote terminal units (RTUs), programmable logic controllers (PLCs), communications, front end processor, back end processor, standby processors, local area network, workstations, keyboards, printers.

1.3 The function of a time source is described.

Range may include but is not limited to – time, frequency, time error, time synchronisation.

Outcome 2

Describe a SCADA system database.

Performance criteria

2.1 SCADA database structure and interaction with displays are described.

Range may include but is not limited to – data types, dynamic data, static data, data quality.

2.2 The possible states of data are described.

Range may include but is not limited to – normal, abnormal, manual override, equipment status colours, alarm status colours, summer and winter options.

2.3 The main purpose of the database backup is described.

Range may include but is not limited to – master and standby backend database, data loss, backup operation.

2.4 SCADA failover is monitored and described.

Range may include but is not limited to – hardware integrity, fatal software faults, failover displays, switch equipment between Central Processing Units (CPUs), taking equipment off line, monitoring disk usage, failover messages.

Outcome 3

Demonstrate the use of SCADA Man Machine Interface (MMI) and full graphics environment in managing the power system.

Range evidence of three occurrences is required.

Performance criteria

3.1 The use of the SCADA MMI workstation is demonstrated.

Range may include but is not limited to – navigation between workstation monitors, mouse, keyboard.

3.2 The use of the full graphics environment is demonstrated.

Range may include but is not limited to – selecting displays, navigation between displays, display hierarchy and grouping, display contents, menus, entering data, printing, symbols, use of colours, alarm banners.

3.3 The use of single line displays (SLDs) to demonstrate station layouts, equipment, and bus voltages is demonstrated.

Range may include but is not limited to – bus and line colour codes, wide and narrow lines, equipment symbols, bus configurations.

Outcome 4

Describe the operational modes available in SCADA to manage the power system.

Performance criteria

4.1 The role of modes in determining the information available to the user is described.

Range may include but is not limited to – defined users, modes categories, assigned permissions, areas of responsibility.

4.2 Mode functionality is described.

Range may include but is not limited to – login, changing password, logout, changing modes.

Outcome 5

Manage the power system using basic SCADA control functions.

Range evidence of three occurrences is required.

Performance criteria

5.1 Commands are issued from SCADA to control equipment and alter the status of information in the SCADA system.

Range may include but is not limited to – issuing controls, entering set points, tagging, alarm inhibiting.

5.2 Events lists are used to display all monitored power system activities.

Range may include but is not limited to – changes of state, controls issued, manually entered information, operator messages, log, device and priority filtering, searches.

Outcome 6

Manage power system alarms.

Performance criteria

6.1 SCADA alarm features are used to monitor real-time events.

Range may include but is not limited to – alarm history list, alarm filtering, alarm groups, alarm severity, audible alarm, alarm limits, colours, priorities.

6.2 Power system alarms are actioned.

Range may include but is not limited to – select, acknowledge, purge, display refresh, filtering.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 July 2002	31 December 2015
Revision	2	11 February 2004	31 December 2015
Rollover and Revision	3	26 November 2007	31 December 2015
Review	4	16 April 2010	31 December 2015
Revision	5	15 September 2011	31 December 2016
Review	6	21 May 2015	31 December 2019
Review	7	26 July 2018	N/A

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 the Infrastructure ITO (Connexis) qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.