Title	**Demonstrate knowledge of wind turbine systems and process safety in a wind farm environment**		
Level	**4**	**Credits**	**15**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: wind turbine systems and how they interrelate; and process safety in a wind farm environment.

Classification	Electricity Supply > Electricity Supply - Power System Maintenance

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* (2015) available from 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.
Process safety refers to the safety of systems holding enormous amounts of energy.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of wind turbine systems and how they interrelate.

Performance criteria

1.1 The concept by which turbine blades generate rotational force to drive electricity generators is explained.

1.2 Component parts which make up a wind driven electricity generator are identified and described.

Range includes – rotor, stator, magnets, induction coils.

1.3 The wind turbine's interaction with the electrical grid is described.

Range electrical phase, frequency, high voltage transformers, substations, reactors, electrical filters.

1.4 The effect of yaw and pitch control on turbine power output is explained.

1.5 Component parts of a drive train and lubrication system in a wind turbine are explained.

Range includes – hub, shaft, grease, oil;
may include – gear box.

1.6 The requirement and method for testing grease and oils are explained.

1.7 Component parts which make up the braking systems of a wind turbine are explained.

Range aerodynamic, mechanical.

1.8 Sources of stored energy in a wind turbine generator are identified and explained. The means of releasing stored energy is explained.

Range mechanical energy, hydraulic pressure, pneumatic pressure, electrical energy, chemical energy.

1.9 Components and systems which generate heat in a wind turbine are described.

Range may include – gearbox, generator, hydraulics, electrical systems.

1.10 Components and systems which make up a wind turbine cooling system are explained.

Range may include – forced air, liquid cooling.

1.11 The operation of a wind turbine is described in terms of the interrelationships between systems.

Outcome 2

Demonstrate knowledge of process safety in a wind farm environment.

Performance criteria

2.1 The difference between process safety and occupational safety and health is described.

2.2 The factors involved in the management of process safety are described.

Range competent people, systems, processes, tools, understanding of risk.

2.3 Personal behaviours to promote process safety are explained.

2.4 Tools and methodologies to promote process safety are explained.

Range may include but is not limited to – swiss cheese model, bowtie analysis, barriers and controls, reporting;
evidence of three tools and/or methodologies is required.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	29 April 2021	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 Connexis - Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.