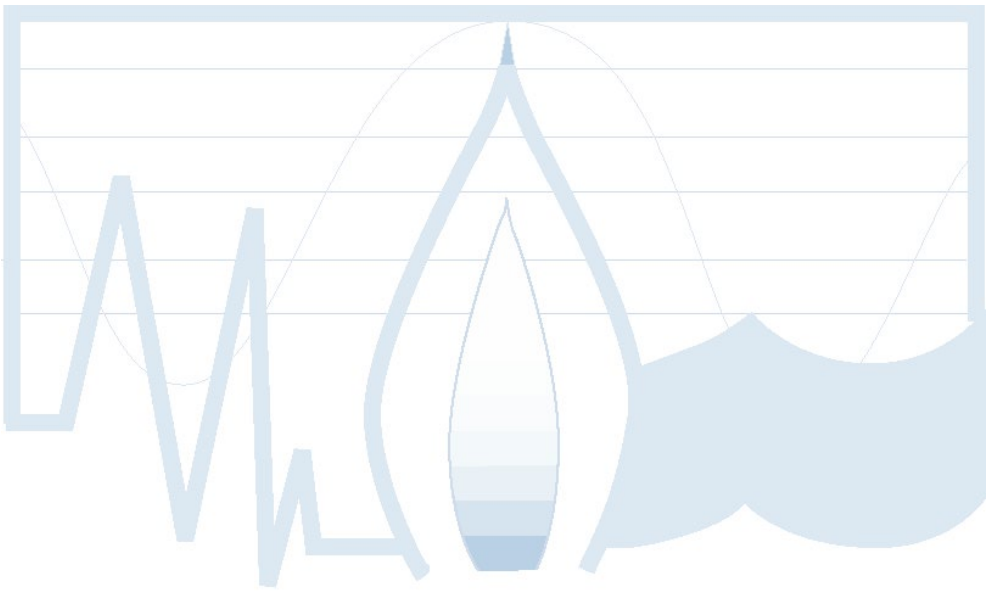

Electricity Supply Industry
Generation Training Package
UTP98
V2.00

Volume 6

Units NEG235 - NEG285

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Glossary

Advanced

High degree of knowledge and skill as would be demonstrated by an 'expert' operative (highly developed analytical, conceptual and problem solving skills).

Alkalinity Reduction

Process of controlling pH of cooling system waters to offset increasing alkalinity due to carbon dioxide loss. Required to maintain optimum pH for effective chlorination and plant protection. Usually done by sulphuric acid injection.

Analysis

Resolution of data into understandable information and its subsequent rational interpretation.

Apparatus

Equipment used in the Power Generation processes.

Ash

Residue of combustion and, in particular, the bottom ash of pulverised fuel combustion.

Assemble

Refers to: the selection, visual inspection, placement and securing of components to form an item of plant, equipment or a structure

Assessment

Refers to: diagnosis of performance, classification of eligibility, award of credentials, assurance of progress of learning.

Auxiliary Steam System

Steam used to assist the generation process, i.e. air extraction, gland sealing etc.

Basic

Fundamental and simplest application.

Batching (Chemicals)

Mixing required quantities of chemicals predominantly for water treatment.

Boiler

Vessel for producing steam under pressure (generic).

Plant used in power production is of large voluminous construction that produce large volumes of high pressure steam required for the thermal power generation process. These boilers contain several stages of superheating and may also contain reheating elements.

Brine Concentrator

Plant for concentrating salts in discharged cooling waters, purifying the majority of water for re-use.

Bulk

Large quantity.

Chemicals

Chemicals used in the power generation processes.

Clean

Make site, buildings, plant and equipment safe, tidy and clear of obstructions (including dirt and grime).

Codes of Practice

Refers to: those relevant standards required within Australia.

Commissioning

Activities carried out to make plant ready for normal operation.

Communications

Conveying information by an approved medium.

Competency

The ability to exercise knowledge and skill in the process of carrying out required tasks/duties.

Component

Any self-contained part, combination of parts, subassemblies of units, which perform a distinctive function necessary to the operation of a system.

Compressed

Reduced in volume.

Condensate System

Part of a generating unit's steam/water cycle, in particular the low pressure water system from the condenser hot well to the boiler feed pump suction including pumps, low pressure feed water heaters, air ejectors, water treatment plants, de-aerators etc.

Condenser

Chamber beneath a turbine's low pressure cylinder(s) in which steam is condensed to water.

Condensing

Make denser or more compact. Main application in the generation industry is the condensing of steam to water.

Condition Changing

Voltage control. Apparatus may include tap changers, reactors and synchronous condensers.

Condition Monitoring

Process of measuring key performance characteristics of an item of equipment on a continuous or regular basis, usually for the purpose of optimising maintenance requirements.

Conduct

1. Manner of doing business or work.

2. Transmission of heat or power.

Contaminated

Polluted. Degradation from a pure or desired state.

Cooling Systems

Various methods of controlling temperature rise in plant by the transfer of heat to a cooling medium during the power generation process.

Coordinate

Cause to function and/or link together in a proper order.

Crisis

Time of danger, acute risk to system or plant, possibility of imminent failure or collapse.

Critical

1. An incident that involves risk and suspense that may require a decisive and crucial response.

2. Sequence of stages determining minimum time needed for an operation (critical path).

Decommission

Remove from service permanently or for a long period of time.

Defect

Any confirmed abnormal condition of an item whether or not this could eventually result in a failure.

Desired

Want earnestly, bordering on required or necessary. The preferred option.

Diagnose and Repair

Refers to corrective maintenance which is the recognition, location and rectification of faults.

Direct (work)

Set direction/requirements and instruct or allocate staff to achieve the required outputs.

Distribution System

Integrated electricity supply system.

Dogging

Attachment of, and the direction of, the lifting of materials in conjunction with a manned crane or hoist.

Drawings

Refers to: block, wiring, PID, schematic, layout drawings and site plans.

Draft System

Plant used to supply adequate air for combustion. Plant may include: fans, air heaters dampers etc.

Dust

Main application: fly ash that is collected in either electrostatic precipitators or fabric filters.

Efficiency

Maximising plant performance by operating to designed parameters.

Electronic Equipment

Refers to: equipment where the majority of its components are electronic.

Emergency Response

Responding to a sudden state of danger or a condition needing immediate treatment.

Enterprise

Refers to electricity generators and their procedures and standards which can refer to isolation/permit procedures, station/depot instructions, work orders and agreed quality assurance requirements.

Environment

The area surrounding the work site which can be directly or indirectly affected by occurrences at the work site. It includes the atmosphere, soils, drains, underground water tables and the ecosystem. Protection of the *environment* would require the proper disposal of waste materials, restriction of burning off, the correct handling of toxic substances, the containment of CFCs and the like.

The protection of the environment would also include the minimisation of those factors that contribute, directly or indirectly, to the production of greenhouse gases.

These contributing factors might include the minimisation of construction waste materials, the correct use of enterprise vehicles and machinery, the re-use or recycling of trade materials where possible and the overall reduction of energy usage through general awareness and the use of appropriate technologies.

Environmental Control

Protection of the surrounding environment. See also *environment*

Erect

Refers to: the actions of preparing foundations, the erection and stabilisation of structures and the placement of electrical equipment.

Explosive Power Tool

Ram set gun or similar tools.

External

Areas external to the power generation site.

Fabricate

To take raw stock and make detailed parts by a variety of methods, such as cutting, bending, attaching, etc. It may be applied to metal and composite structures, electrical parts, etc.

Facilitating

Promote or help forward.

Feedwater

High pressure and high temperature treated water supplied to a boiler.

Feedwater System

Part of a generating unit's steam/water cycle, in particular the high pressure water system from the feed pump suction to the boiler including pumps, economiser high pressure feed water heaters, feedwater regulating valves etc.

Field (operations)

External to the main centre of operation.

Fork Lift

Vehicle with fork in front for lifting and moving materials.

Fuel

Used for combustion and may include coal, gas, oil, refuse etc.

Generation

Production of electricity.

Hardware

Refers to: material or non-moving parts of systems including such items as insulators. "Hardware" does not include electrical apparatus.

High Voltage

Equal to, or greater than, 1000 volts AC or 1500 volts DC.

HV

High Voltage.

HV Apparatus

Equipment used for transportation and control of electricity.

Implement

Put into effect.

Inspect

To examine or check a system, assembly, component or part by visual or physical means for the purpose of identifying defects or limits.

Inspection

Examine closely.

Install

Refers to: the fitting and positioning of new plant, equipment and/or systems, and the replacement of plant, equipment and/or systems following overhaul or maintenance.

Intermediate

Skills and knowledge greater than a basic level but with room for further development available (experienced but not yet expert).

Internal

Areas internal to the power generation site.

Internal Combustion Duel Fuel Reciprocating Engine

Engine having two fuel sources (normally diesel fuel and gas).

Internal Combustion Single Fuel Reciprocating Engine

Engine having one fuel source.

Isolated Power Systems

Power systems not connected to a power grid, ie Alice Springs.

Key Role

Essential or of vital importance.

Lay

Refers to: the placement in position of underground cables in preparation for jointing and terminating.

Liaise

Communicate and cooperate with an outside organisation, section or person.

Lifting and Load Shifting Equipment (1)

Cranes and hoists that do not require a licence to operate.

Lifting and Load Shifting Equipment (2)

Cranes and hoists that do require a licence to operate.

Local

Controlling equipment from controls located adjacent to an item of plant.

Locomotive

A diesel or steam engine providing the motive power to haul load-carrying wagons.

Low Voltage

Not exceeding 1000 volts AC or 1500 volts DC.

Lubrication

Minimisation of friction by the application of specified oils or greases.

LV

Low Voltage.

Maintain

Refers to: preventative maintenance and the replacement of damaged or faulty components found during preventative maintenance.

Make and Spread (stockpile)

The formation of, and the management of, a stockpile (usually coal).

Manage (plant operations)

Planning, preparing, organisation and actual operation of major plant startups or shutdowns plus the in service control of normal and abnormal plant operating conditions.

Manoeuvering

Planned and controlled movements towards a defined objective.

Material

Matter used in the power production processes including raw, processed, building plant or offices materials.

Maximum

Highest allowable limit.

Minimum

Lowest allowable limit.

Modify

Refers to: alterations, additions, adjustments or re-adjustments to existing equipment

Monitor

Maintain regular surveillance (see also ‘condition monitoring’).

Network

Chain of interconnected electrical conductors, integrated electricity grid system.

Non-Routine

Outside normal daily operations or practices.

Occupational Health and Safety Standards

Refers to: those which are relevant within Australia.

Operate

Bring about a controlled change in plant output.

Operational

Be able to operate or function.

Operator (power generation)

Personnel employed to operate, monitor and control power generation plant.

Organise

Give orderly structure to, make arrangements for or initiate (undertaking).

Others Involved In Or Affected By The Work

Refers to: supervisor, foreperson, other tradespersons, operations personnel and other workers.

Outage

Period of non-operation.

Perform

Carry into effect, execute (operation).

Performance Testing

Check of plant output under test conditions.

Permit to Work

Written approval to work (in safety and in a clearly defined area).

Plan

Formulated or organised methods by which actions are to be done in order to achieve a defined objective or outcome.

Plant

1. Apparatus associated with power production.

2. Mobile plant i.e. implements and vehicles.

Power

Electrical energy.

Process

Controlled course of actions to achieve a required output/outcome.

Production

Produce (electrical energy) in large quantities.

Promote

Help forward, encourage.

Protection Devices/Schemes

Devices, or a number of devices working together, to protect plant and equipment from damage during fault conditions or out of limits operations.

Plug-In Printed Circuit Boards

Refers to: the placement of individual plug-in printed circuit boards, regardless of whether the connections are plugs or soldered, which do not require any additional setting up/tuning.

Quality

Maintaining a high degree of excellence (meeting requirements/standards).

Receive

Accept delivery of (coal).

Reclaim

Recover (coal) from stockpile.

Record

Piece of recorded information, account or fact preserved in a permanent document or electronically.

Rectification

1. Converting AC to DC .

2. Process of repairing faults or failures of equipment or systems.

Regulatory Authority

Refers to: any organisation or department which has a responsibility for establishing and monitoring adherence to procedures, specifications or standards within the Generation sector.

Reliability

May be relied upon (to continue producing). Measure of the probability of failure.

Relocating

Move to a new position.

Request/Work Orders

Refers to: work generated by schedules, instructions, handover details from previous shift, inspection test plant, defect cards, danger tags.

Requirements

That to which *equipment* and procedures and their outcomes must conform and includes statutory obligations and regulations and *Standards* called-up by legislation or regulations. *Requirements* may include:

- codes of practice
- job specifications
- *Standards* called-up in specifications
- procedures and work instructions
- quality assurance systems
- manufacturers' specifications
- design specifications
- customer/client requirements and specifications
- specified underpinning knowledge (specified in units' Evidence Guides)
- National and State guidelines, policies and imperatives relating to the *environment.*

Reverse Osmosis

Process of removing chemicals from (usually) water by forcing it through a semi permeable membrane using high pressure.

Rigging

Set up slings etc. to ensure a controlled lift of materials by hoists and/or cranes.

Ringmain

Distribution systems for either water, steam or power supplies in the form of a continuous ring.

Risk

Exposure to danger, hazards, losses etc.

SCADA Control

System Control And Data Acquisition system. Screen based remote monitoring and control of a process/acquisition system.

Scaffold

Temporary elevated platform to assist or enable access for inspection or maintenance requirements.

Schedule

Planned output (generation).

Service

Refers to: procedural maintenance which would, in general, be of a routine nature.

Set-up

Refers to: specifications set by manufacturers', client/user requirements.

Shift (material)

Change or move from one place to another.

Shunting

1. Procedure for warming de-aerator.

2. Divert (train) onto a side track to clear the line.

Site

Location of power generation plant.

Stakeholders

Those who have an influence on activities (power generation).

Standard

1. Degree of excellence required for a particular purpose.

2. Required quality of work.

Statutory requirements

Refers to: those standards required by the relevant regulatory or licensing authority eg. Worksafe Australia, SAA Wiring rules.

Steam/Water Cycle

Major or main cycle of steam and water through a boiler and/or steam turbine. Includes valves piping, heat exchangers, superheat and reheat elements, boiler drum(s) etc.

Stockpile

Accumulated stock of raw materials (mainly coal).

Strategies

Plans formed to achieve specific outcomes.

String

Refers to: the placement of aerial conductors/cables in position, including tensioning.

Structure

Refers to: a pole or tower with associated hardware which supports electrical apparatus.

Switchboard

A combination of cubicles or switches located together that enable the connection or disconnection of electrical circuits.

Switchgear

Apparatus designed to make or break electrical connections.

Systems

Systems in the generation industry means the interaction between a number of elements requiring consideration of the total effect of the parts, rather than a concentration on any single part, and in respect of which actions and responses that are needed, may require analytical skills and techniques.

Tasks

Single items of work.

Team

People working together in a cooperative/collaborative manner.

Technical Inspection

Examine closely, utilising specific criteria relevant to the apparatus concerned.

Test

Refers to: testing and/or functioning (operating) an assembly, component or part to make sure that it agrees with the applicable specifications. In this definition testing provides a way in which adjustment and/or troubleshooting/diagnosis can occur.

Test and Commission

Refers to: the checking of individual equipment/components for correct operation and the placement into service of the equipment or system.

Test (operational)

Operate under a strictly controlled manner to check/determine the condition of an item of plant. This may include a complete system, a complete item of plant (i.e. boiler fan) or an individual component.

Tippling

Discharging of coal (or other material) from a railway wagon.

Tools

Refers to general hand tools, portable electric tools and specialist tools.

Transfer (material)

Move or relocate.

Transformers

Apparatus for reducing or increasing voltage in an AC system.

Transport Plant and Equipment

Moving mobile plant and associated equipment.

Tune

Refers to: correcting or altering a system, circuit, components or indicators to provide a specified outcome or condition.

Turbine

Wheel or rotor driven by the impact or reaction of steam or water (generic). Main plant item in thermal or hydro power production consisting of a number of stages. May include a number of turbines connected in tandem.

Undertake

Be committed to perform, or take responsibility for, work, testing etc.

Waste

Substances of no further use in the power production process, i.e. ash.

Water Quality Control System

System(s) utilised to continually monitor and adjust the quality of water used in the power generation process.

Water Treatment

The treatment processes used to condition raw water to make it suitable for use in the power generation processes.

Wind Generator

Device to convert air currents into electrical energy.

Work Completion Details

Refers to: time sheets, job cards, plans and records.

UTP NEG235 A
Monitor Efficiency of Thermal Steam Cycle Power Plant

Descriptor: This unit refers to the collection of data and the calculation of the efficiency of plant associated with the thermal steam cycle

Elements		Performance criteria	
235.1	Collect data	235.1.1	Information is co-ordinated/collected in accordance with statutory, industry and enterprise/site requirements
		235.1.2	Plant is correctly identified and status established
		235.1.3	Tools and equipment are correctly identified and acquired
		235.1.4	Specialist assistance/equipment is sort when required
		235.1.5	Information is recorded in accordance with statutory, industry and enterprise/site requirements
		235.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
235.2	Perform calculations	235.2.1	Availability and performance calculations are performed in accordance with statutory, industry and enterprise/site requirements
		235.2.2	Information input/output is checked for accuracy
		235.2.3	Performance is measured and calculated in accordance with appropriate statutory requirements and standards
235.3	Evaluate and analyse information	235.3.1	Analyse technical and operational information in a logical and sequential manner, and identify if abnormal plant operating condition/performance exists
		235.3.2	Causes of any abnormal plant efficiency are identified
		235.3.3	Plant integrity is maintained through consultation and operational documentation
		235.3.4	Specialist assistance is sought as required

Elements		Performance criteria	
235.4	Produce report and complete work	235.4.1	Information and data are co-ordinated and documented in accordance with requirements
		235.4.2	Reports are produced in accordance with statutory, industry and enterprise/site requirements
		235.4.3	Recommendations are made to appropriate personnel
		235.4.4	Implementation of recommendations are monitored to ensure plant efficiency

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Test equipment may include data loggers, calculators, unit computers, personal computers, flow meters, thermocouples, multimeters and flow meters

Information source may be verbal, written, computer, unit computer logs, enterprise standards, operating and maintenance standards

Specialist assistance may be sought such as metallurgy, chemical, operating and engineering staff

Reports may be daily, weekly, quarterly and yearly; electronic, written or verbal

Documentation may include site instructions, enterprise standing instructions, enterprise safety procedures, operating instructions, occupational health and safety legislation, environmental legislation, operating and maintenance manuals, plans and diagrams

Work site environment may be affected by nearby plant or processes, e.g. chemical, heat, noise, gas and hazards

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Plant operating parameters

Plant performance characteristics

Evaluating and analysing information

Context of assessment

Competency Standards should be assessed on site or in a simulated work environment under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health and safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Environmental awareness; Relevant plant and equipment; Location of relevant plant and equipment; Enterprise recording procedures; Plant and plant systems; Plant performance characteristics; Unit computers; Mechanical and electrical processes; Communication principles; Personnel computers; Materials; Monitoring procedures

The ability to:

Apply relevant occupational health and safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate plant within design parameters; Identify plant status; Record, analyse and use data; Apply problem solving techniques; Communicate effectively; Plan and prioritise work; Write reports; Apply data analysis techniques and tools; Determine plant performance.

UTP NEG236 A
Monitor Power Generation Plant Reliability

Descriptor: This unit refers to generating plant reliability

Elements		Performance criteria	
236.1	Collect data	236.1.1	Information is co-ordinated/collected in accordance with statutory, industry and enterprise/site requirements
		236.1.2	Plant is correctly identified and status established
		236.1.3	Tools and equipment are correctly identified and acquired
		236.1.4	Specialist assistance/equipment is sort when required
		236.1.5	Information is recorded in accordance with statutory, industry and enterprise/site requirements
		236.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
236.2	Perform calculations	236.2.1	Availability and performance calculations are performed in accordance with statutory, industry and enterprise/site requirements
		236.2.2	Calculations are checked for accuracy
236.3	Evaluate and analyse information	236.3.1	Analyse technical and operational information in a logical and sequential manner, and identify if abnormal plant operating condition/performance exists
		236.3.2	Causes of any abnormal plant reliability are identified
		236.3.3	Plant integrity is maintained through consultation and operational documentation
		236.3.4	Specialist assistance is sought as required
236.4	Produce report and complete work	236.4.1	Information and data are co-ordinated and documented in accordance with requirements
		236.4.2	Reports are produced in accordance with statutory, industry and enterprise/site requirements

Elements	Performance criteria	
	236.4.3	Actions necessary to rectify loss of reliability are recommended to the appropriate personnel
	236.4.3	Implementation of recommendations are monitored to ensure plant reliability

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Test equipment may include multimeters, gas analysis, leak seekers, tachometers and volumeters

Information source may be verbal, written, computer based, logs, enterprise standards and procedures

Specialist assistance may be sought from staff such as metallurgy, chemical, operating and engineering staff

Reports may be daily, weekly, quarterly and yearly; electronic, written or verbal

Documentation may include site instructions, enterprise standing instructions, enterprise safety procedures, operating instructions, occupational health and safety legislation, environmental legislation, operating and maintenance manuals, plans and diagrams

Work site environment may be affected by nearby plant or processes, e.g. chemical, heat, noise and gas

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Data acquisition systems

Evaluate and analyse data

Work completion procedures, reporting procedures

Context of assessment

Competency Standards should be assessed on site or in a simulated work environment under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health and safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Environmental awareness; Relevant plant and equipment; Location of relevant plant and equipment; Enterprise recording procedures; Plant and plant systems; Plant performance characteristics; Control and data acquisition systems; Mechanical and electrical processes; Communication principles; Computers and software; Materials stress characteristics; Plant monitoring procedures

The ability to:

Apply relevant occupational health and safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate plant within design parameters; Identify plant status; Record, analyse and use data; Apply problem solving techniques; Communicate effectively; Plan and prioritise work; Write reports; Apply data analysis techniques and tools; Determine plant performance.

UTP NEG237 A
Tune Process Plant and Equipment

Descriptor: This unit refers to the investigation, nomination and adjustments of tuning parameters associated with generation plant, equipment and processes

Elements		Performance criteria	
237.1	Plan and prepare	237.1.1	Tuning requirements are identified from relevant personnel and documentation
		237.1.2	Resource and equipment requirements are identified and obtained
		237.1.3	Tuning program is co-ordinated with the appropriate personnel and plant availability, capability and limitations are identified
		237.1.4	Test and monitoring equipment are connected in accordance with test requirements and plant integrity
		237.1.5	Plant co-ordinated to initial operating state ready for testing in accordance with statutory, industry and enterprise/site procedure standards
		237.1.6	Test procedure and recording documentation are prepared
		237.1.7	Test equipment is calibrated in accordance with relevant standards and/or manufacturer's procedures
		237.1.8	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
237.2	Test plant and implement tuning	237.2.1	Testing and tuning is performed in accordance with tuning program, variations are assessed and accommodated to enable test objectives to be met
		237.2.2	Results are analysed with reference to desired outcomes and new settings are determined
		237.2.3	Accuracy of test results is assessed in analysis of test data and corrections made as required
		237.2.4	Plant is retuned to achieve desired outcomes

Elements		Performance criteria	
237.3	Complete documentation	237.3.1	All relevant records and documentation are updated and retained in accordance with enterprise/site requirements
		237.3.2	Nominated changes to equipment operational settings are recommended to appropriate personnel
		237.3.3	Implementation of recommendations are monitored to ensure combustion efficiency

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Generation plant to be tuned may include oil, gas or coal firing equipment; draft systems and associated systems; unit control equipment, turbine systems, steam and water systems; water treatment plant, dust collection plant; unit computer or distributive control systems

Variables include age of plant, plant duty and varying ages of control equipment

Documentation may include; drawings, logic diagrams, function diagrams, plant records, testing procedures, plant notes, test equipment calibration certificates, manufacturer's operating and maintenance manuals; plant incident reports, specialist reports and manufacturer's recommendations

Resources may include internal service groups, external specialists and specialised testing equipment

Technical considerations may include control systems rate of change, plant overshoot/undershoot, plant capability/limitations, control system type and design

Process considerations may include; pressure, level, flow, temperature, speed and vibration and mix

Statutory requirements may include occupational health and safety legislation, and environmental legislation

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Planning for tuning procedures

Tuning processes and techniques

Testing and monitoring procedures

Work completion procedures

Context of assessment

Competency Standards should be assessed on site or in a simulated work environment under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health and safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Environmental procedures; Relevant plant and equipment; Location of relevant plant and equipment; Enterprise recording procedures; Plant processes and process dynamics; Programming and testing requirements; Plant capability limitations; Means of accessing test points; Tuning processes and techniques; Relevant plant variables that can be monitored; Field device and plant characteristics; Tuning algorithms; Control systems function and logic scaling requirements; Scheduling (planning) and testing activities; Testing and tuning techniques; Structure and design technology of power generation plant

The ability to:

Apply relevant occupational health and safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate plant within design parameters; Identify plant status; Use enterprise documentation procedures; Solve problems; Set-up and use test/tuning equipment; Co-ordinate testing operations; Communicate effectively; Prepare engineering programmes/ procedures/reports; Analyse test results and translate to tuning settings for optimal system response; Apply testing and tuning techniques; Apply data analysis techniques and tools.

UTP NEG238 A
Perform Process Plant Inspections

Descriptor: This unit refers to the inspection of generation production plant and associated equipment

Elements		Performance criteria	
238.1	Prepare for inspection	238.1.1	Relevant maintenance and operating history is obtained in accordance with work requirements
		238.1.2	Needs and outcomes for plant inspections are defined in accordance with work requirements
		238.1.3	Appropriate method sheets/check sheets are obtained in accordance with work requirements
		238.1.4	Availability and access to plant is determined in accordance with work requirements
		238.1.5	Preparations for inspection are undertaken in accordance with enterprise/site procedures
		238.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
238.2	Inspect process plant	238.2.1	Process plant is inspected in accordance with relevant sections of enterprise, state, or national standards
		238.2.2	Process plant is identified and operational status determined in accordance with enterprise/site procedures
		238.2.3	Inspection is conducted using appropriate methods in accordance with enterprise/site procedures
		238.2.4	Needs and outcomes for the inspection are achieved in accordance with work requirements
238.3	Complete the documentation	238.3.1	Relevant records and documentation are updated in accordance with job requirements and enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Generation plant and/or equipment may include fired and unfired pressure vessels; pipe work; valves and fittings; turbines and generators; chemical and water treatment processes; instrumentation and process control; and civil, electrical, thermal and mechanical works

Relevant standards may include sections of occupational health and safety legislation, enterprise safety rules and procedures, relevant state and federal legislation, national standards or codes of practices for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; equipment and alarm manuals; dedicated computer equipment; drawings, logic diagrams; plant records; enterprise/site log books; and manufacturer's operation and maintenance manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual); remote or local indicators and recorders and alarms (visible and/or audible)

Inspection results may be conveyed to supervisor/team leader or equivalent; technical and engineering officers or equivalent; power system control personnel or equivalent; maintenance staff, power plant operations personnel; contractor and external specialist personnel

Inspection environment may be remote from plant; aided by indicators and monitors; during inclement or otherwise harsh weather conditions; in wet/noisy/dusty areas; during night periods and in confined spaces

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

The process plant and its operating parameters

Inspection procedures and techniques

Identifying worn, damaged or faulty plant and equipment

Context of assessment

Competency Standards should be assessed on site or in a simulated work environment under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health and safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Environmental awareness; Location of relevant plant and equipment and its operating parameters; Enterprise recording procedures; Inspection procedures; Basic principles of related plant systems; Safety data sheets; Communication principles

The ability to:

Apply relevant occupational health and safety regulations; Apply relevant statutory legislation; Apply enterprise/site emergency procedures and techniques; Apply relevant enterprise/site safety procedures; Apply enterprise recording procedures; Locate relevant plant and equipment; Identify plant status; Recognise abnormal plant operating conditions; Communicate effectively; Recognise worn, damaged or seized components; Apply inspection techniques.

UTP NEG239 A
Conduct Non-routine Operational Testing

Descriptor: This unit refers to the testing of generation plant and associated equipment which may be of a non-routine nature

Elements		Performance criteria	
239.1	Prepare for testing	239.1.1	Safety issues are identified and complied with in accordance with enterprise/site and legislative requirements
		239.1.2	Needs and outcomes for the tests are defined in accordance with work requirements
		239.1.3	Test procedures are determined and monitoring equipment requirements are defined in accordance with the test objectives
		239.1.4	Availability and access to plant is determined in accordance with work requirements
		239.1.5	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the testing procedure
		239.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
239.2	Conduct non-routine testing	239.2.1	Testing is performed in accordance with relevant sections of enterprise, state or national standards and codes of practise
		239.2.2	Required isolations are confirmed where appropriate in accordance with enterprise/site requirements
		239.2.3	Testing is performed in accordance with defined procedures application to the test
		239.2.4	Plant is observed and corrective action taken when response is not in accordance with plant operating parameters/plant integrity or personnel safety
		239.2.5	Testing completed, permits relinquished where appropriate, and plant returned to required operational status

Elements		Performance criteria	
239.3	Complete the work	239.3.1	Appropriate personnel notified of the completion of testing in accordance with enterprise/site procedures
		239.3.2	Plant problems or abnormalities are reported and logged in accordance with enterprise/site procedures
		239.3.3	Test results/observations are interpreted and documented in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Generation plant and/or equipment may include turbines and generators; mills; fans; pumps; heat exchangers; fired and unfired pressure vessels; motors; transformers; switchgear; pneumatic, hydraulic and electrical/electronic control systems; cooling systems; and chemical treatment and water quality systems

Relevant standards may include sections of occupational health and safety legislation, enterprise safety rules and procedures, relevant state and federal legislation, national standards or codes of practices for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; equipment and alarm manuals; dedicated computer equipment; drawings, logic diagrams; plant records; enterprise/site log books; and manufacturer's operation and maintenance manuals

Testing may include commissioning of newly installed plant or equipment/ post maintenance tests, QA/QC tests and fault finding procedures

Test results may be conveyed to supervisor/team leader or equivalent; technical and engineering officers or equivalent; power system control personnel or equivalent; maintenance staff; power plant operations staff personnel; contractor and external specialist personnel

Testing environment may be remote from plant; aided by indicators and monitors; during inclement or otherwise harsh weather conditions; wet/noisy/dusty areas; during night periods; and in confined spaces

Test equipment may include calculators, thermocouples, multimeters, flow meters, stopwatch, check sheets, data logger, power or hand tools

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparation and planning of work

Testing techniques and procedures

Operational requirements of the plant and/or associated equipment

Context of assessment

Competency Standards should be assessed on site or in a simulated work environment under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health and safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Location of relevant plant and equipment and its operating parameters; Testing procedures and techniques; Enterprise recording procedures; Isolation procedures; Communication principles

The ability to:

Apply relevant occupational health and safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Locate relevant plant and equipment; Identify plant status; Recognise abnormal plant operating conditions; Restore normal operating conditions; Apply testing techniques and procedures; Use testing equipment; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG243 A
Install Instrumentation Equipment

Descriptor: This unit refers to the installation of instrumentation used in a "closed loop" system, including, but not limited to, sensor elements, signal characterising equipment, input/output blocks, controllers, transducers and final elements

Elements		Performance criteria	
243.1	Plan and prepare for the work	243.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		243.1.2	Occupational health and safety standards, statutory requirements, relevant australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		243.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		243.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		243.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		243.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		243.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		243.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		243.1.9	Work area is prepared in accordance with work requirements and site procedures
		243.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
243.2	Install the equipment	243.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		243.2.2	Equipment is assembled, positioned and secured in accordance with appropriate plans, drawings and texts
		243.2.3	Equipment is installed in conjunction with others involved or affected by the work in accordance with the work plan
		243.2.4	Conductors are identified and appropriately labelled/colour coded in accordance with the work plan
		243.2.5	Conductors are run, secured, glanded and terminated to appropriate specifications in accordance with the work plan
		243.2.6	Final job inspection is carried out and any permits relinquished in accordance with the work plan
243.3	Complete the work	243.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		243.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		243.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		243.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 5.1 of the Electrical Contracting Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include gauges, transmitters, switches, thermocouples, RTD's, thermostats, indicators, meters, proximity probes, indication slide wires, control valves, valve positioners, lock up valves, power cylinders, power cylinder positioners, I/P and E/P converters, air relays, pressure regulators, solenoid valves, analogue indicators, fire detectors, smoke detectors, vibration detectors, gas detectors and fuel valves

Materials may include fixings such as bolts, nuts, screws, masonry anchors, cable and tube anchors, flexible multicore cable, brackets, cleaning solvents, lugs such as solder, non-insulated crimp and pre-insulated crimp, connectors such as wire termination devices, co-axial, multi-pin plug and socket, tag strips, pins and spades, tube termination devices, tube-tube connectors and bulkhead-tube, soft solder and flumes

Test and measurement instruments may include insulation tester and multimeter

Work completion details may include plant and maintenance records, job cards, check sheets, on device labelling updates, reporting and/or documenting equipment defects

Work site environment may be affected by nearby plant or processes, e.g. chemical, heat, dust, noise, gas and oil

Isolations can refer to electrical/mechanical or other associated or process

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparation and planning of work

Installation techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Installation requirements of the equipment; Instrumentation equipment; Piping and tubing equipment; Electrical fundamentals; Test and measurement instruments; Engineering and workshop practice; Instrument technology; Regulatory aspects; Circuit plan appreciation; Communication principles

The ability to:

Apply occupational health and safety standards; Apply relevant Australian standards; Follow relevant Statutory requirements and codes of practice; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Use correct termination procedures; Use correct installation procedures; Identify and select relevant materials; Carry out work completion details; Apply electrical fundamentals theory; Apply regulatory aspects theory; Install piping and tubing equipment; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG244 A
Install Instrumentation Wiring Systems

Descriptor: This unit refers to the installation of instrumentation wiring systems include, but not limited to cords and cables such as flexible multicore, thermocouple, co-axial, ribbon and hook up cable, signal and data cable

Elements		Performance criteria	
244.1	Plan and prepare for the work	244.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		244.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		244.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		244.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		244.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		244.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		244.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		244.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		244.1.9	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		244.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
244.2	Install the wiring enclosures/support systems	244.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		244.2.2	Wiring enclosures/support systems are assembled/positioned and secured in accordance with appropriate plans, drawings and texts
		244.2.3	Wiring enclosures/support systems are installed in conjunction with others involved in or affected by the work in accordance with the work plan
		244.2.4	Wiring enclosures/support systems are inspected to ensure freedom from defects and damage in accordance with the work plan
244.3	Install the wiring	244.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		244.3.2	Wiring is positioned, secured and labelled for identification in accordance with appropriate plans, drawings and texts
		244.3.3	Wiring is installed in conjunction with others involved in or affected by the work in accordance with the work plan
		244.3.4	Wiring is inspected to ensure freedom from defects, damage and undue stress in accordance with the work plan
		244.3.5	Final job inspection is completed and any necessary permits relinquished in accordance with the work plan
244.4	Complete the work	244.4.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		244.4.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures

Elements	Performance criteria	
	244.4.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
	244.4.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on units 5.3 (Instrument Stream) and 4.2 (Electronic Stream) of the Electrical Contractors Industry Association Competency Standards

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Wiring systems can refer to cords and cables such as flexible multi-core, thermocouple, coxial, ribbon and hook up cable, signal and data cable, ducts such as PVC and metal, trunking, condults and fittings such as PVC and metal (rigid and flexible) pipes, elbows, bends, tees, junction boxes, hose terminators, saddles, spacers, bushes, adaptors and locknuts, wire loom support, cable ties, unistrut, trays and ladder racks

Wiring can refer to cords and cables

Wiring enclosures can refer to ducts, trunking, condults and fittings

Support systems can refer to wire loom support, cable ties, unistrut, trays and ladder racks

Materials may refer to solder/flux, thread cutting compounds, thread sealing compounds, PVC cement, sleeving such as PVC, heat shrink, fibre glass, porcelain beads, neoprene rubber, insulating tapes, fixings such as screws, masonry anchors, nuts and bolts, cable clips, cable ties, spiral binding, spring clips, cable mounts, cable glands and cable anchors

Test and measurement instruments may refer to continuity testers and multimeters

Work completion details may include plant and maintenance records, job cards, check sheets, on device labelling updates and reporting and/or documenting equipment defects

Work site environment may be affected by nearby plant or processes, e.g. chemical, heat, dust, noise, gas and oil

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Installation techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Installation requirements of the equipment; Wiring systems; Electrical fundamentals; Test and measurement instruments; Engineering and workshop practice; Instrument technology; Regulatory aspects; Circuit plan appreciation; Communication principles

The ability to:

Apply occupational health and safety standards; Apply relevant Australian standards; Follow relevant Statutory requirements and codes of practice; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Select and install wiring systems; Inspect wiring systems; Identify and select relevant materials; Carry out work completion details; Apply electrical fundamentals theory; Apply regulatory aspects theory; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG245 A
Install Complex/Electronic Instrumentaton Equipment

Descriptor: This unit refers to the installation of instrumentation used in a "multi-loop" configuration, including, but not limited to, signal characterising equipment, totaliser units, microprocessor control equipment, interface equipment, laboratory and field analysers, ultrasonic and nucleonics equipment

Elements		Performance criteria	
245.1	Plan and prepare for the work	245.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		245.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		245.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		245.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		245.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		245.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		245.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		245.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		245.1.9	Work area is prepared in accordance with work requirements and site procedures
		245.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
245.2	Install the equipment	245.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		245.2.2	Equipment is assembled, positioned and secured in accordance with appropriate plans, drawings and texts
		245.2.3	Equipment is installed in conjunction with others involved or affected by the work in accordance with the work plan
		245.2.5	Conductors are run, secured, glanded and terminated to appropriate specifications in accordance with the work plan
		245.2.6	Final job inspection is carried out and any permits relinquished in accordance with the work plan
245.3	Complete the work	245.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		245.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		245.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		245.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.1 of the Electrical Contracting Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include CO2, H2, pH, dissolved O2, conductivity and optical density analysers, recorders, nuclear devices, smart transmitters, magflow meters, coal feeders, belt weigher, PLC's, ultrasonic sensors, hydraulic control equipment, turbine supervisory equipment detectors, test equipment, transducers, pneumatic controllers, fire panels, T/C converters, electronic controllers, wear monitors, printers, printer circuit boards, UV sterilisation equipment, gas detection equipment and surge suppression equipment

Materials may include fixings such as bolts, nuts, screws, masonry anchors, cable and tube anchors, flexible multicore cable, brackets, cleaning solvents, lugs such as solder, non-insulated crimp and pre-insulated crimp, connectors such as wire termination devices, co-axial, multi-pin plug and socket, tag strips, pins and spades, tube termination devices, tube-tube connectors and bulkhead-tube, soft solder and fluxes

Test and measurement instruments may include insulation testers, multimeters and hand-held programmers

Installation includes the entering of programs and/or parameters into equipment, where required

Work completion details may include plant and maintenance records, job cards, check sheets, on device labelling updates and reporting and/or documenting equipment defects

Work site environment may be affected by nearby plant or processes, e.g. chemical, heat, dust, noise, gas and oil

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Installation techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Installation requirements of the equipment; Programmable control; Distributed control; Complex instrumentation equipment; Electrical fundamentals; Test and measurement instruments; Engineering and electronic workshop practice; Instrument technology; Regulatory aspects; Circuit plan appreciation; Communication principles

The ability to:

Apply occupational health and safety standards; Apply relevant Australian standards; Follow relevant Statutory requirements and codes of practice; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Use correct termination procedures; Use correct installation procedures; Apply distributed control theory; Apply programmable control theory; Identify and select relevant materials; Carry out work completion details; Apply electrical fundamentals theory; Apply regulatory aspects theory; Communicate effectively; Apply data analysis techniques and tools; Apply engineering and workshop practices

UTP NEG246 A
Maintain Instrumentaton Equipment

Descriptor: This unit refers to the maintenance of instrumentation equipment including, but not limited to, process measurement and control and analytical instrumentation

Elements		Performance criteria	
246.1	Plan and prepare for the work	246.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		246.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		246.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		246.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		246.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		246.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		246.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		246.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		246.1.9	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		246.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
246.2	Carry out maintenance	246.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		246.2.2	Equipment is maintained using appropriate plans, drawings and texts in accordance with the work plan
		246.2.3	Equipment is maintained in conjunction with others involved in, or affected by, the work in accordance with the work plan
		246.2.4	Calibration and/or adjustments required are carried out to ensure equipment operates within requirements in accordance with the work plan
		246.2.5	Maintenance and calibration/adjustments carried out mindful of effects on, or unnecessary loss of, other equipment
		246.2.6	Final job inspection is carried out and permits relinquished in accordance with the work plan
246.3	Complete the work	246.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		246.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		246.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		246.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream:	Production Plant
Field:	Maintenance
Equivalencies:	This unit of competence is based on unit 5.7 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include gauges, transmitters, switches, thermocouples, RTD's, thermostats, indicators, meters, proximity probes, indication slide wires, control valves, valve positioners, lock up valves, power cylinders, power cylinder positioners, I/P and E/P converters, air relays, pressure regulators, solenoid valves, analogue indicators, fire detectors, smoke detectors, vibration detectors, gas detectors and fuel valves

Materials may include lubricants, cleaning solvents, gasket materials and lead test solution

Components may include hair springs, gauge movements, pneumatic restrictors, air relays, microswitches, flapper/nozzles, diaphragms, springs, bellows, gaskets, shuttle valves, pilot valves, amplifier modules, coils and plug in printed circuit boards

Test and measurement instruments may include dead weight tester, pneumatic calibrator, vacuum pump gauge/, manometer, precision pressure gauge, hand-held pressure pump, comparator, temperature baths, oven, multimeter, variable power supply, DC I/V standard, potentiometer and decade box

Work may be performed with equipment on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Maintenance techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Maintenance techniques for the equipment; Instrumentation equipment; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Instrument installation practice; Circuit plan appreciation; Engineering and workshop practice; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Use correct maintenance procedures; Use correct calibration procedures; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG247 A
Maintain Complex Instrumentation Equipment

Descriptor: This unit refers to the maintenance of complex instrumentation equipment including, but not limited to, multi-loop equipment such as signal characterising, analogue control equipment, microprocessor control such as programmable logic, laboratory and industrial analysers, ultra sonic and nucleonic equipment

Elements		Performance criteria	
247.1	Plan and prepare for the work	247.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		247.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		247.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		247.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		247.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		247.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		247.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		247.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		247.1.9	Work area is prepared in accordance with work requirements and site procedures
		247.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
247.2	Carry out maintenance	247.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		247.2.2	Equipment is maintained using appropriate plans, drawings and texts in accordance with the work plan
		247.2.3	Equipment is maintained in conjunction with others involved in, or affected by, the work in accordance with the work plan
		247.2.4	Calibration and/or adjustments required are carried out to ensure equipment operates within requirements in accordance with the work plan
		247.2.5	Maintenance and calibration/adjustments carried out mindful of effects on, or unnecessary loss of, other equipment
		247.2.6	Final job inspection is carried out and permits relinquished in accordance with the work plan
247.3	Complete the work	247.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		247.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		247.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		247.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.3 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include CO2, H2, pH, dissolved O2, conductivity and optical density analysers, recorders, nuclear devices, smart transmitters, magflow meters, coal feeders, belt weigher, PLC's, ultrasonic sensors, hydraulic control equipment, turbine supervisory equipment, detectors, test equipment, transducers, pneumatic controllers, fire panels, T/C converters, electronic controllers, wear monitors, printers, printer circuit boards, UV sterilisation equipment, gas detection equipment and surge suppression equipment

Materials may include lubricants, cleaning solvents, gasket materials and lead test solution

Components may include gas analyser, sensing elements, liquid analyser sensing elements, columns, thermal/conductive detectors, infra-red sources, filters, chopper motors, balancing motors, servo motors, chart drives, relays, load cells, tachometers, PLC input/output blocks, amplifying modules, servo valves and plug-in printed circuit boards

Test and measurement instruments may include multimeter, standard gases, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, frequency generator, CRO, variac and specialised test equipment

Work may be performed with equipment on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or process, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Maintenance techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Maintenance techniques for the equipment; Complex instrument equipment; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Circuit plan appreciation; Engineering and workshop practice; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Use correct maintenance procedures; Use correct calibration procedures; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG248 A
Maintain Electronic Instrumentation Equipment

Descriptor: This unit refers to the maintenance of electronic instrumentation equipment

Elements		Performance criteria	
248.1	Plan and prepare for the work	248.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		248.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		248.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		248.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		248.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		248.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		248.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		248.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		248.1.9	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		248.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
248.2	Carry out maintenance	248.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		248.2.2	Equipment is maintained using appropriate plans, drawings and texts in accordance with the work plan
		248.2.3	Equipment is maintained in conjunction with others involved in, or affected by, the work in accordance with the work plan
		248.2.4	Calibration and/or adjustments required are carried out to ensure equipment operates within requirements in accordance with the work plan
		248.2.5	Maintenance and calibration/adjustments carried out mindful of effects on, or unnecessary loss of, other equipment
		248.2.6	Final job inspection is carried out and permits relinquished in accordance with the work plan
248.3	Complete the work	248.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		248.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		248.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		248.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.3 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include analysers, recorders, nuclear devices, fire panels, T/C converters, electronic controllers, smart transmitters, coal feeders, belt weighers, PLC's, ultrasonic sensors, turbine/compressor supervisory equipment, combustion control equipment, wear monitors, water ingress protection equipment, printers, compressor surge control equipment, fuel governor equipment, gas detection panels and temperature monitoring equipment

Materials may include cables, solder/flux, lubricants, cleaning solvents, contact cleaners, connectors, adhesive and sealants

Components may include analyser sensing elements, load cells, PLC input/output blocks, printed circuit boards, protection devices, switches, diodes, transistors, SCR's, triacs, diacs, LEDs, integrated circuits, resistors, capacitors, inductors and transformers

Test and measurement instruments may include multimeter, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/ programmer, frequency counter, function generator, CRO, LCR bridge, logic analyser and specialised test equipment

Work may be performed with equipment on line.

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates.

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Maintenance techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Maintenance techniques for the equipment; Electronic instrument equipment; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Circuit plan appreciation; Instrumentation electronics; Engineering and workshop practice; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Use correct maintenance procedures; Use correct calibration procedures; Identify and select materials for the job; Apply regulatory aspects theory; Apply instrumentation electronics theory; Apply electrical fundamentals theory; Apply distributed control theory; Apply programmable control theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG249 A
Diagnose and Repair Faults in Instrumentation Equipment

Descriptor: This unit of competence encompasses the diagnose and repair (to block level) instrumentation used in "closed loop" system, including, but not limited to, sensor elements, signal characterising equipment, input/output blocks, controllers, transducers and final elements

Elements		Performance criteria	
249.1	Plan and prepare for the work	249.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		249.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		249.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		249.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		249.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		249.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		249.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		249.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		249.1.9	Work area is prepared in accordance with work requirements and site procedures
		249.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
249.2	Verify the fault	249.2.1	Normal performance and function of the equipment is ascertained by consulting appropriate reference sources in accordance with the work plan
		249.2.2	Fault indicators, appropriate technical information/diagnostic techniques are used to verify reported symptoms/faults in accordance with the work plan
		249.2.3	Symptoms are reproduced and monitored if possible, whilst due regard for personnel safety and plant security is observed in accordance with the work plan
249.3	Find the fault	249.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		249.3.2	Fault finding is carried out in conjunction with others involved in or affected by the work in accordance with enterprise/job requirements
		249.3.3	Equipment components, wires, cables, terminations and support fixings are inspected for obvious faults in accordance with the work plan
		249.3.4	All appropriate fault finding/diagnostic techniques are identified, selected and used to determine the fault in accordance with the work plan
		249.3.5	All appropriate components are disconnected to enable accurate test measurements of suspected faulty components without the concern of “back feed” readings in accordance with the work plan

Elements		Performance criteria	
		249.3.6	Test and measurement instruments are used in accordance with manufacturer's instructions and job requirements
249.4	Determine cause of fault	249.4.1	All appropriate personnel are consulted in order to obtain as many details relating to the faulty equipment as possible in accordance with the work plan
		249.4.2	Appropriate use is made of any information from fault indicators and maintenance records in accordance with the work plan
		249.4.3	Valid conclusions about the nature and cause of the fault are reached from analysis of available evidence in accordance with the work plan
249.5	Repair or rectify the fault	249.5.1	Required isolations are confirmed where appropriate in accordance with site requirements
		249.5.2	Appropriate repair procedures are undertaken in conjunction with others involved in, or affected by, the work in accordance with the work plan
		249.5.3	Faulty, worn, damaged or unsecured components are replaced, repaired or secured in accordance with the work plan
		249.5.4	Parts and components are selected and replaced as required in accordance with appropriate specifications and the work plan
		249.5.5	Components disconnected for testing are reconnected having been proven free of faults and all terminations are then checked to ensure they are electrically and mechanically sound in accordance with the work plan
		249.5.6	All faults are repaired or rectified in accordance with the work plan
		249.5.7	Final job inspection is performed and permits are relinquished as required in accordance with the work plan

Elements		Performance criteria	
249.6	Complete the work	249.6.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		249.6.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		249.6.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		249.6.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 5.5 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include gauges, transmitters, switches, thermocouples, RTD's, thermostats, indicators, meters, proximity probes, indication slide wires, control valves, valve positioners, lock up valves, power cylinders, power cylinder positioners, I/P and E/P converters, air relays, pressure regulators, solenoid valves, analogue indicators, fire detectors, smoke detectors, vibration detectors, gas detectors and fuel valves

Materials may include lubricants, cleaning solvents, gasket materials, leak test solution, connectors and fittings

Components may include hair springs, gauge movements, pneumatic restrictors, air relays, microswitches, flapper/nozzles, diaphragms, springs, bellows, gaskets, shuttle valves, pilot valves, amplifier modules, coils and plug in printed circuit boards

Test and measurement instruments may include dead weight tester, pneumatic calibrator, vacuum pump gauge/, manometer, precision pressure gauge, hand-held pressure pump, comparator, temperature baths, oven, multimeter, variable power supply, DC I/V standard, potentiometer and decade box

Fault finding and diagnostic techniques may include linear approach, half split rule, sensory detection, insulation/resistance and continuity tests

Fault indicators may include indication lamps, LEDs, alarms and flag relays

Work may be performed with equipment on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Verification techniques

Diagnostic and fault finding techniques and procedures

Repair techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Fault finding and diagnostic techniques; Repair techniques; Instrumentation equipment; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Engineering and electronic workshop practice; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Verify and identify faults; Use appropriate fault finding and diagnostic techniques; Determine the cause of faults; Repair faults; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools; Apply engineering and electronic workshop practices

UTP NEG250 A
Diagnose and Repair Faults in Complex Instrumentation Equipment

Descriptor: This unit refers to the diagnose and repair of complex instrumentation configuration including, but not limited to, signal characterising equipment, totaliser units, microprocessor control equipment, interface equipment, laboratory and field analysers, ultrasonic and nucleonic equipment

Element		Performance criteria	
250.1	Plan and prepare the work	250.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection.
		250.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedures.
		250.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications.
		250.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan.
		250.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.

Element		Performance criteria	
		250.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plan security and capacity in accordance with system/site requirements.
		250.1.7	Co-ordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		250.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.
		250.1.9	Work area is prepared in accordance with work requirements and site procedures.
		250.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of on-the-job training.
250.2	Verify the fault	250.2.1	Normal performance and function of the equipment is ascertained by consulting appropriate reference sources in accordance with the work plan.
		250.2.2	Fault indicators, appropriate technical information/diagnostic techniques are used to verify reported symptoms/faults in accordance with the work plan.
		250.2.3	Symptoms are reproduced and monitored if possible, whilst due regard for personnel safety and plant security is observed in accordance with the work plan.

Element		Performance criteria	
250.3	Find the fault	250.3.1	Required isolations are confirmed where appropriate in accordance with site requirements.
		250.3.2	Fault finding is carried out in conjunction with others involved in, or affected by, the work in accordance with enterprise/job requirements.
		250.3.3	Equipment components, wires, cables, terminations and support fixings are inspected for obvious faults in accordance with the work plan.
		250.3.4	All appropriate fault finding/diagnostic techniques are identified, selected and used to determine the fault in accordance with the work plan.
		250.3.5	All appropriate components are disconnected to enable accurate test measurements of suspected faulty components without the concern of "back feed" readings in accordance with the work plan.
		250.3.6	Test and measurement instruments are used in accordance with manufacturers' job requirements.
250.4	Determine cause of fault	250.4.1	All appropriate personnel are consulted in order to obtain as many details relating to the faulty equipment as possible in accordance with the work plan.
		250.4.2	Appropriate use is made of any information from fault indicators and maintenance records in accordance with the work plan.
		250.4.3	Valid conclusions about the nature and cause of the fault are reached from analysis of available evidence in accordance with the work plan.

Element		Performance criteria	
250.5	Repair or rectify the fault	250.5.1	Required isolations are confirmed where appropriate in accordance with site requirements.
		250.5.2	Appropriate repair procedures are undertaken in conjunction with others involved in, or affected by, the work in accordance with the work plan.
		250.5.3	Faulty, worn, damaged or unsecured components are replaced, repaired or secured in accordance with the work plan.
		250.5.4	Parts and components are selected and replaced as required in accordance with appropriate specifications and the work plan.
		250.5.5	Components disconnected for testing are reconnected having been proven free of faults and all terminations are then checked to ensure they are electrically and mechanically sound in accordance with the work plan.
		250.5.6	All faults are repaired or rectified in accordance with the work plan.
		250.5.7	Final job inspection is performed and permits are relinquished as required in accordance with the work plan.
250.6	Complete the work	250.6.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements.
		250.6.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures.
		250.6.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures.
		250.6.4	Work completion details are finalised in accordance with site/enterprise procedures.

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.2 of the Electrical Contractors Industry Association Competency Standards (Instrumentation System)

Equipment may include CO_2; H_2; PH; dissolved O_2; conductivity and optical density analysers; recorders; nuclear devices; smart transmitters: magflow meters; coal feeders; belt weigher; PLCs; ultrasonic sensors; hydraulic control equipment; turbine supervisory equipment; detectors; test equipment; transducers; pneumatic controllers; fire panels; T/C converters; electronic controllers; wear monitors; printers; printer circuit boards; UV sterilisation equipment; gas detection equipment and surge suppression equipment

Materials may include lubricants; cleaning solvents; gasket materials and leak test solution

Components may include gas analyser; sensing elements; liquid analyser sensing elements; columns; thermal/conductive detectors; infra-red sources; filters; chopper motors; balancing motors; servo motors; chart drives; relays; load cells; tachometers; PLC input/output blocks; amplifying modules; servo valves and plug-in PCBs

Test and measurement instruments may include multimeter; standard gases; decade box; DC, I/V standard; potentiometer; radiation meter; hand-held communicator/programmer; frequency counter; frequency generator; CRO, variac and specialised test equipment

Fault find and diagnostic techniques may include linear approach; half split rule; sensory detection/ insulation/resistance and continuity test

Fault find and diagnostic techniques may include linear approach; half split rule; sensory detection; insulation/resistance and continuity tests

Fault indicators may include indication lamps; LEDs; alarms and flag relays

Work may be performed on line

Work completion details may include plant and maintenance records; job cards; check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, eg heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

It is essential that competence is assessed in the critical aspects of:

The knowledge and application of relevant sections of occupational health and safety legislation, statutory legislation, enterprise/site safety procedures; enterprise/site emergency procedures; attainment of electrical licence, where appropriate, deeming competency associated with electrical work; preparation and planning of work; verification techniques; diagnostic and fault finding techniques and procedures; repair techniques and procedures; completion of work procedures

Context for assessment

Competency standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and applications of work.

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; relevant statutory requirements and codes of practice; relevant Australian standards; equipment and material required to perform the work; isolation procedures; general layout of plant/work site and operation of its equipment; fault finding and diagnostic techniques; repair techniques; complex instrumentation equipment; regulatory aspects; electrical fundamentals; test and measurement instruments; engineering and electronic workshop practice; distributed control; programmable control; communication principles

The ability to:

Apply occupational health and safety standards; follow relevant statutory regulations and codes of practice; apply relevant Australian standards; locate and interpret plans, drawings and text; use tools and relevant equipment; use test and measurement instruments; verify and identify faults; use appropriate fault finding and diagnostic techniques; determine the cause of faults; repair faults; identify and select materials for the job; apply regulatory aspects theory; apply electrical fundamentals theory; carry out work completion details; apply distributed control theory; communicate effectively; apply data analysis techniques and tools; Apply engineering and electronic workshop practices

UTP NEG251 A
Diagnose and Repair Faults in Instrumentation Systems

Descriptor: This unit refers to the diagnose and repair of instrumentation systems and all ancillary equipment including, but not limited to, PC operating systems, distributive control systems, programmable logic control systems, process control systems

Elements		Performance criteria	
251.1	Plan and prepare for the work	251.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		251.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		251.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		251.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		251.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		251.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		251.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		251.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		251.1.9	Work area is prepared in accordance with work requirements and site procedures
		251.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
251.2	Verify the fault	251.2.1	Normal performance and function of the equipment is ascertained by consulting appropriate reference sources in accordance with the work plan
		251.2.2	Fault indicators, appropriate technical information/diagnostic techniques are used to verify reported symptoms/faults in accordance with the work plan
		251.2.3	Symptoms are reproduced and monitored if possible, whilst due regard for personnel safety and plant security is observed in accordance with the work plan
251.3	Find the fault	251.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		251.3.2	Fault finding is carried out in conjunction with others involved in, or affected by, the work in accordance with enterprise/job requirements
		251.3.3	Equipment components, wires, cables, terminations and support fixings are inspected for obvious faults in accordance with the work plan

Elements		Performance criteria	
		251.3.4	All appropriate fault finding/diagnostic techniques are identified, selected and used to determine the fault in accordance with the work plan
		251.3.5	All appropriate components are disconnected to enable accurate test measurements of suspected faulty components without the concern of "back feed" readings in accordance with the work plan
		251.3.6	Test and measurement instruments are used in accordance with manufacturer's instructions and job requirements
251.4	Determine cause of fault	251.4.1	All appropriate personnel are consulted in order to obtain as many details relating to the faulty equipment as possible in accordance with the work plan
		251.4.2	Appropriate use is made of any information from fault indicators and maintenance records in accordance with the work plan
		251.4.3	Valid conclusions about the nature and cause of the fault are reached from analysis of available evidence in accordance with the work plan
251.5	Repair or rectify the fault	251.5.1	Required isolations are confirmed where appropriate in accordance with site requirements
		251.5.2	Appropriate repair procedures are undertaken in conjunction with others involved in, or affected by, the work in accordance with the work plan
		251.5.3	Faulty, worn, damaged or unsecured components are replaced, repaired or secured in accordance with the work plan
		251.5.4	Parts and components are selected and replaced as required in accordance with appropriate specifications and the work plan

Elements	Performance criteria	
	251.5.5	Components disconnected for testing are reconnected having been proven free of faults and all terminations are then checked to ensure they are electrically and mechanically sound in accordance with the work plan
	251.5.6	All faults are repaired or rectified in accordance with the work plan
	251.5.7	Final job inspection is performed and permits are relinquished as required in accordance with the work plan
251.6 Complete the work	251.6.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
	251.6.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
	251.6.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
	251.6.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 9.1 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Systems may include process control systems, PLCs, hydraulic control systems, turbine supervisory systems, water ingress protection system, flame surveillance systems, compressor surge control systems and fire detection/suppression systems

Materials may include cables, solder/flux, lubricants, cleaning solvents, contact cleaners, connectors, adhesive and sealants

Components may include power supplies, relays, PLC input/output blocks, printed circuit boards, protection devices, switches, transformers, servo valves, positioners, converters, controllers, function cards and transmitters

Test and measurement instruments may include multimeter, decade box, DC I/V standard, potentiometer, hand-held communicator/programmer, frequency counter, function generator, CRO, LCR bridge, logic analyser and specialised test equipment

Fault finding and diagnostic techniques may include linear approach, half split rule, sensory detection, insulation/resistance and continuity tests

Fault indicators may include indication lamps, LEDs, alarms and flag relays

Work may be performed with system on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Verification techniques

Diagnostic and fault finding techniques and procedures

Repair techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Instrument systems; Repair techniques; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Engineering and workshop practice; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Carry out work in a logical and safe manner; Use tools and relevant equipment; Use test and measurement instruments; Verify and identify faults; Use appropriate fault finding and diagnostic techniques; Determine the cause of faults; Repair faults; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Apply distributed control theory; Apply programmable control theory; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG252 A
Modify Instrumentation Equipment

Descriptor: This unit refers to the modification of instrumentation used in a "closed loop" system, including, but not limited to, sensor elements, signal characterising equipment, input/output blocks, controllers, transducers, final elements

Elements		Performance criteria	
252.1	Plan and prepare for the work	252.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		252.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		252.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		252.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		252.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		252.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		252.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work.
		252.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		252.1.9	Work area is prepared in accordance with work requirements and site procedures
		252.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
252.2	Carry out modification	252.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		252.2.2	Equipment is modified using appropriate plans, drawings and texts in accordance with the work plan
		252.2.3	Equipment is modified in conjunction with others involved in, or affected by, the work in accordance with the work plan
		252.2.4	Modifications are carried out mindful of effects on or unnecessary loss of other equipment in accordance with the work plan
		252.2.5	Modified equipment is set up to suit operational requirements and in accordance with manufacturer's specifications and the work plan
		252.2.6	Final job inspection is performed and permits relinquished as required in accordance with the work plan
252.3	Complete the work	252.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		252.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		252.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		252.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 6.3 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include gauges, transmitters, switches, thermocouples, RTDs, thermostats, indicators, meters, proximity probes, indication slide wires, control valves, valve positioners, lock up valves, power cylinders, power cylinder positioners, I/P and E/P converters, air relays, pressure regulators, solenoid valves, analogue indicators, fire detectors, smoke detectors, vibration detectors, gas detectors and fuel valve

Materials may include fixings such as bolts, nuts, screws, masonry anchors, cable and tube anchors, flexible multicore cable, brackets, cleaning solvents, lugs such as solder, non-insulated crimp and pre-insulated crimp, connectors such as wire termination devices, co-axial, multi-pin plug and socket, tag strips, pins and spades, tube termination devices, tube-tube connectors and bulkhead-tube, soft solder and flumes, lubricants, cleaning solvents, gasket materials, leak test solution, connectors and fittings

Components may include hair springs, gauge movements, pneumatic restrictors, air relays, microswitches, flapper/nozzles, diaphragms, springs, bellows, gaskets, shuttle valves, pilot valves, amplifier modules, coils and plug in printed circuit boards

Test and measurement instruments may include dead weight tester, pneumatic calibrator, vacuum pump gauge/, manometer, precision pressure gauge, hand-held pressure pump, comparator, temperature baths, oven, multimeter, variable power supply, DC I/V standard, potentiometer and decade box

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Modification techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Modification techniques; Instrumentation equipment and technology; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Engineering and workshop practice; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Modify instrumentation equipment; Update plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG253 A
Modify Complex Instrumentation Equipment

Descriptor: This unit refers to the modification of complex instrumentation used in a "multi-loop" configuration, including, characterising equipment, microprocessor control equipment, interface equipment, laboratory and field analysers, ultra-sonic and nucleonic equipment

Elements		Performance criteria	
253.1	Plan and prepare for the work	253.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		253.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		253.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		253.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		253.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		253.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		253.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		253.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		253.1.9	Work area is prepared in accordance with work requirements and site procedures
		253.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
253.2	Carry out modification	253.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		253.2.2	Equipment is modified using appropriate plans, drawings and text in accordance with the work plan
		253.2.3	Equipment is modified in conjunction with others involved in or affected by the work in accordance with the work plan
		253.2.4	Modifications are carried out mindful of effects on, or unnecessary loss of, other equipment in accordance with the work plan
		253.2.5	Modified equipment is set up to suit operational requirements and in accordance with manufacturer's specifications and the work plan
		253.2.6	Final job inspection is performed and permits relinquished as required in accordance with the work plan
253.3	Complete the work	253.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		253.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		253.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		253.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.4 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include CO_2, H_2, pH, dissolved O_2, conductivity and optical density analysers, recorders, nuclear devices, smart transmitters, magflow meters, coal feeders, belt weigher, PLC's, ultrasonic sensors, hydraulic control equipment, turbine supervisory equipment, detectors, test equipment, transducers, pneumatic controllers, fire panels, T/C converters, electronic controllers, wear monitors, printers, printer circuit boards, UV sterilisation equipment, gas detection equipment and surge suppression equipment

Materials may include lubricants, cleaning solvents, gasket materials and leak test solution

Components may include gas analyser, sensing elements, liquid analyser sensing elements, columns, thermal/conductive detectors, infra-red sources, filters, chopper motors, balancing motors, servo motors, chart drives, relays, load cells, tachometers, PLC input/output blocks, amplifying modules, servo valves and plug- in PCBs

Test and measurement instruments may include multimeter, standard gases, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, frequency generator, CRO, variac and specialised test equipment

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Modification techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Modification techniques; Complex instrumentation equipment and technology; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Engineering and workshop practice; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Modify instrumentation equipment; Update plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG254 A
Modify Electronic Instrumentation Equipment

Descriptor: This unit refers to the modification of electronic equipment including, but not limited to, process control instrumentation, power grid energy control, supervisory instrumentation, security equipment (CCTV)

Elements		Performance criteria	
254.1	Plan and prepare for the work	254.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		254.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		254.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		254.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		254.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		254.1.6	Work is planned in detail including sequencing and prioritising and considerations made where appropriate for the maintenance of plant security and capacity in accordance with system/site requirements
		254.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		254.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures.
		254.1.9	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		254.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
254.2	Carry out modification	254.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		254.2.2	Equipment is modified using appropriate plans, drawings and text in accordance with the work plan
		254.2.3	Equipment is modified in conjunction with others involved in, or affected by, the work in accordance with the work plan
		254.2.4	Modifications are carried out mindful of effects on, or unnecessary loss of, other equipment in accordance with the work plan
		254.2.5	Modified equipment is set up to suit operational requirements and in accordance with manufacturer's specifications and the work plan
		254.2.6	Final job inspection is performed and permits relinquished as required in accordance with the work plan
254.3	Complete the work	254.3.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		254.3.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		254.3.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		254.3.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.4 of the Electrical Contractors Industry Association Competency Standards (Electronic Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include analysers, recorders, nuclear devices, fire panels, T/C converters, electronic controllers, smart transmitters, coal feeders, belt weighers, PLC's, ultrasonic sensors, turbine/compressor supervisory equipment, combustion control equipment, wear monitors, water ingress protection equipment, printers, compressor surge control equipment, fuel governor equipment, gas detection panels and temperature monitoring equipment

Materials may include cables, solder/flux, lubricants, cleaning solvents, contact cleaners, connectors, adhesive and sealants

Components may include power supplies, relays, analysing sensor elements, load cells, PLC input/output blocks, printed circuit boards, protection devices, switches, diodes, transistors, SCR's, triacs, diacs, LEDs, integrated circuits, resistors, capacitors, inductors and transformers

Test and measurement instruments may refer to multimeter, decade box, DC I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, CRO, function generator, LCR bridge, logic analyser and specialised test equipment

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or process

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Modification techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Modification techniques; Electronic instrumentation equipment and technology; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Engineering and electronic workshop practice; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Modify instrumentation equipment; Update plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools. Applying engineering and electronic workshop practices

UTP NEG255 A
Test and Commission Instrumentation Equipment

Descriptor: This unit refers to the testing and commissioning of instrumentation wiring systems, piping and tubing systems and equipment, including, but not limited to process measuring and control instrumentation and analytical instrumentation

Elements		Performance criteria	
255.1	Plan and prepare for the work	255.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		255.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		255.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		255.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		255.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications.
		255.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		255.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		255.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		255.1.9	Work area is prepared in accordance with work requirements and site procedures
		255.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
255.2	Test wiring systems	255.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		255.2.2	Wiring systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		255.2.3	Wiring systems are tested in conjunction with others involved in, or affected by, the work in accordance with the work plan
		255.2.4	Wiring systems, including enclosures/ supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		255.2.5	Fixed wiring is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications
255.3	Test piping and tubing systems	255.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		255.3.2	Piping and tubing systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		255.3.3	Piping and tubing systems are tested in conjunction with other involved in, or affected by, the work in accordance with the work plan
		255.3.4	Piping and tubing systems, including enclosures/supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan

Elements		Performance criteria	
		255.3.5	Fixed piping and tubing is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications and the work plan
255.4	Test the equipment	255.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		255.4.2	Equipment is tested using appropriate plans, drawings and text in accordance with the work plan
		255.4.3	Equipment is tested in conjunction with other involved in or affected by the work in accordance with the work plan
		255.4.4	Required test conditions are confirmed and the equipment is inspected to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		255.4.5	Equipment is tested using appropriate test techniques in accordance with the work plan
		255.4.6	Equipment test results/observations are interpreted and documented to confirm compliance with job specifications
255.5	Commission the equipment	255.5.1	Required isolations are confirmed where appropriate in accordance with site requirements
		255.5.2	Equipment is commissioned using appropriate plans, drawings and texts in accordance with the work plan
		255.5.3	Equipment is commissioned in conjunction with others involved in, or affected by, the work in accordance with the work plan
		255.5.4	Equipment is set up in accordance with operational requirements/manufacturer's specifications
		255.5.5	Testing and monitoring procedures are followed and results monitored, interpreted and documented to ensure equipment operates/functions within specifications

Elements		Performance criteria	
		255.5.6	Equipment is commissioned with due regard being paid to plant security and capacity in accordance with the work plan
		255.5.7	Final job inspection is carried out and permits relinquished as required in accordance with the work plan
255.6	Complete the work	255.6.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		255.6.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		255.6.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		255.6.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 5.4 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include gauges, transmitters, switches, thermocouples, RTDs, thermostats, indicators, meters, proximity probes, indication slide wires, control valves, valve positioners, lock up valves, power cylinders, power cylinder positioners, I/P and E/P converters, air relays, pressure regulators, solenoid valves, analogue indicators, fire detectors, smoke detectors, vibration detectors, gas detectors and fuel valves

Wiring systems can refer to cords and cables such as flexible multi-core, thermocouple, coxial, ribbon and hook up cable, signal and data cable, ducts such as PVC and metal, trunking, condults and fittings such as PVC and metal (rigid and flexible) pipes, elbows, bends, tees, junction boxes, hose terminators, saddles, spacers, bushes, adaptors and locknuts, wire loom support, cable ties, unistrut, trays and ladder racks

Piping and tubing systems may refer to piping/tubing, piping/tubing enclosures, fittings and support systems

Components may include hair springs, gauge movements, pneumatic restrictors, air relays, microswitches, flapper/nozzles, diaphragms, springs, bellows, gaskets, shuttle valves, pilot valves, amplifier modules, coils and plug in printed circuit boards

Test and measurement instruments may include dead weight tester, pneumatic calibrator, vacuum pump gauge, manometer, precision pressure gauge, hand-held pressure pump, comparator, temperature baths, oven, multimeter, variable power supply, DC I/V standard, potentiometer and decade box

Fixed wiring tests can refer to polarity, loop impedance and continuity

Fixed piping and tubing tests can refer to leak and continuity

Monitoring equipment can refer to test recorder/data logger

Work may be performed with equipment on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Testing techniques

Commissioning techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Preparation and planning of work; Testing techniques; Commissioning techniques and procedures; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Circuit plan appreciation; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Inspect and test the wiring systems; Inspect and test piping and tubing systems; Inspect, test and monitor equipment; Commission the equipment; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Update plans, drawings and text; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG256 A
Test and Commission Complex Instrumentation Equipment

Descriptor: This unit refers to the testing and commissioning of complex instrumentation used in "multi-loop" configuration, including, but not limited to signal characterising equipment, totaliser units, microprocessor control equipment, interface equipment, laboratory and field analysers, ultra-sonic and nucleonics equipment

Elements		Performance criteria	
256.1	Plan and prepare for the work	256.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		256.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure.
		256.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		256.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		256.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		256.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		256.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work

Elements		Performance criteria	
		256.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		256.1.9	Work area is prepared in accordance with work requirements and site procedures
		256.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
256.2	Test wiring systems	256.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		256.2.2	Wiring systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		256.2.3	Wiring systems are tested in conjunction with others involved in, or affected by, the work in accordance with the work plan
		256.2.4	Wiring systems, including enclosures/ supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		256.2.5	Fixed wiring is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications
256.3	Test piping and tubing systems	256.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		256.3.2	Piping and tubing systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		256.3.3	Piping and tubing systems are tested in conjunction with other involved in, or affected by, the work in accordance with the work plan

Elements		Performance criteria	
		256.3.4	Piping and tubing systems, including enclosures/supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		256.3.5	Fixed piping and tubing is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications and the work plan
256.4	Test the equipment	256.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		256.4.2	Equipment is tested using appropriate plans, drawings and texts in accordance with the work plan
		256.4.3	Equipment is tested in conjunction with other involved in, or affected by, the work in accordance with the work plan
		256.4.4	Required test conditions are confirmed and the equipment is inspected to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		256.4.5	Equipment is tested using appropriate test techniques in accordance with the work plan
		256.4.6	Equipment test results/observations are interpreted and documented to confirm compliance with job specifications
256.4	Commission the equipment	256.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		256.4.2	Equipment is commissioned using appropriate plans, drawings and texts in accordance with the work plan
		256.4.3	Equipment is commissioned in conjunction with others involved in, or affected by, the work in accordance with the work plan
		256.4.4	Equipment is set up in accordance with operational requirements/manufacturer's specifications

Elements		Performance criteria	
		256.4.5	Testing and monitoring procedures are followed and results monitored, interpreted and documented to ensure equipment operates/functions within specifications
		256.4.6	Equipment is commissioned with due regard being paid to plant security and capacity in accordance with the work plan
		256.4.7	Final job inspection is carried out and permits relinquished as required in accordance with the work plan
256.5	Complete the work	256.5.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		256.5.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		256.5.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		256.5.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.5 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include CO_2, H_2, pH, dissolved O_2, conductivity and optical density analysers, recorders, nuclear devices, smart transmitters, magflow meters, coal feeders, belt weigher, PLCs, ultrasonic sensors, hydraulic control equipment, turbine supervisory equipment, detectors, test equipment, transducers, pneumatic controllers, fire panels, T/C converters, electronic controllers, wear monitors, printers, printer circuit boards, UV sterilisation equipment, gas detection equipment and surge suppression equipment

Wiring systems can refer to cords and cables such as flexible multi-core, thermocouple, coxial, ribbon and hook up cable, signal and data cable, ducts such as PVC and metal, trunking, condults and fittings such as PVC and metal (rigid and flexible) pipes, elbows, bends, tees, junction boxes, hose terminators, saddles, spacers, bushes, adaptors and locknuts, wire loom support, cable ties, unistrut, trays and ladder racks

Piping and tubing systems may refer to piping/tubing, piping/tubing enclosures, fittings and support systems

Components may include gas analyser, sensing elements, liquid analyser sensing elements, columns, thermal/conductive detectors, infra-red sources, filters, chopper motors, balancing motors, servo motors, chart drives, relays, load cells, tachometers, PLC input/output blocks, amplifying modules, servo valves and plug-in PCBs

Test and measurement instruments may include multimeter, standard gases, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, frequency generator, CRO, variac and specialised test equipment

Fixed wiring tests can refer to polarity, loop impedance and continuity

Fixed piping and tubing tests can refer to leak and continuity

Monitoring equipment can refer to test recorder/data logger

Work may be performed with equipment on-line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates.

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Testing techniques

Commissioning techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Operating principles of the equipment; Testing and commissioning procedures and techniques; Operational requirements of the equipment; Complex instrument equipment; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Circuit plan appreciation; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Inspect and test the wiring systems; Inspect and test piping and tubing systems; Inspect, test and monitor equipment; Commission the equipment; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Carry out work completion details; Update plans, drawings and text; Apply distributed control theory; Apply programmable control theory; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG257 A
Test and Commission Electronic Instrumentation Equipment

Descriptor: This unit refers to the testing and commissioning of electronic wiring systems and complex digital/analogue equipment including, but not limited to, process control instrumentation, power grid energy control, supervisory instrumentation, security equipment (CCTV)

Elements		Performance criteria	
257.1	Plan and prepare for the work	257.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		257.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		257.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		257.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		257.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		257.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		257.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		257.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		257.1.9	Work area is prepared in accordance with work requirements and site procedures
		257.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
257.2	Test wiring systems	257.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		257.2.2	Wiring systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		257.2.3	Wiring systems are tested in conjunction with others involved in, or affected by, the work in accordance with the work plan
		257.2.4	Wiring systems, including enclosures/ supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		257.2.5	Fixed wiring is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications
257.3	Test piping and tubing systems	257.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		257.3.2	Piping and tubing systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		257.3.3	Piping and tubing systems are tested in conjunction with other involved in, or affected by, the work in accordance with the work plan
		257.3.4	Piping and tubing systems, including enclosures/supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan

Elements		Performance criteria	
		257.3.5	Fixed piping and tubing is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications and the work plan
257.4	Test the equipment	257.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		257.4.2	Equipment is tested using appropriate plans, drawings and texts in accordance with the work plan
		257.4.3	Equipment is tested in conjunction with other involved in, or affected by, the work in accordance with the work plan
		257.4.4	Required test conditions are confirmed and the equipment is inspected to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		257.4.5	Equipment is tested using appropriate test techniques in accordance with the work plan
		257.4.6	Equipment test results/observations are interpreted and documented to confirm compliance with job specifications
257.4	Commission the equipment	257.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		257.4.2	Equipment is commissioned using appropriate plans, drawings and texts in accordance with the work plan
		257.4.3	Equipment is commissioned in conjunction with others involved in, or affected by, the work in accordance with the work plan
		257.4.4	Equipment is set up in accordance with operational requirements/manufacturer's specifications
		257.4.5	Testing and monitoring procedures are followed and results monitored, interpreted and documented to ensure equipment operates/functions within specifications

Elements		Performance criteria	
		257.4.6	Equipment is commissioned with due regard being paid to plant security and capacity in accordance with the work plan
		257.4.7	Final job inspection is carried out and permits relinquished as required in accordance with the work plan
257.5	Complete the work	257.5.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		257.5.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		257.5.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		257.5.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 7.5 of the Electrical Contractors Industry Association Competency Standards (Electronic Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Equipment may include analysers, recorders, nuclear devices, fire panels, T/C converters, electronic controllers, smart transmitters, coal feeders, belt weighers, PLCs, ultrasonic sensors, turbine/compressor supervisory equipment, combustion control equipment, wear monitors, water ingress protection equipment, printers, compressor surge control equipment, fuel governor equipment, gas detection panels and temperature monitoring equipment

Wiring systems can refer to cords and cables such as flexible multi-core, thermocouple, coxial, ribbon and hook up cable, signal and data cable, ducts such as PVC and metal, trunking, condults and fittings such as PVC and metal (rigid and flexible) pipes, elbows, bends, tees, junction boxes, hose terminators, saddles, spacers, bushes, adaptors and locknuts, wire loom support, cable ties, unistrut, trays and ladder racks

Piping and tubing systems may refer to piping/tubing, piping/tubing enclosures, fittings and support systems

Components may include power supplies, relays, analysing sensor elements, load cells, PLC input/output blocks, printed circuit boards, protection devices, switches, diodes, transistors, SCR's, triacs, diacs, LEDs, integrated circuits, resistors, capacitors, inductors and transformers

Test and measurement instruments may include multimeter, standard gases, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, function generator, CRO, LCR bridge, logic analyser and specialised test equipment

Fixed wiring tests can refer to polarity, loop impedance and continuity

Fixed piping and tubing tests can refer to leak and continuity

Monitoring equipment can refer to test recorder/data logger

Work may be performed with equipment on line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Testing techniques

Commissioning techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Operating principles of the equipment; Testing and commissioning procedures and techniques; Operational requirements of the equipment; Electronic instrumentation equipment; Regulatory aspects; Electrical fundamentals; Electronic workshop practices; Test and measurement instruments; Circuit plan appreciation; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Inspect and test the wiring systems; Inspect and test piping and tubing systems; Inspect, test and monitor equipment; Commission the equipment; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Update plans, drawings and text; Apply distributed control theory; Apply programmable control theory; Communicate effectively; Apply data analysis techniques and tools; Apply electronic workshop practices

UTP NEG258 A
Test and Commission Instrumentation Systems

Descriptor: This unit refers to the testing and commissioning of instrumentation systems and all ancillary equipment including, but not limited to, PC operating systems, distributive control systems, programmable logic control systems, process control systems

Elements		Performance criteria	
258.1	Plan and prepare for the work	258.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		258.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		258.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		258.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		258.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		258.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		258.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		258.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures

Elements		Performance criteria	
		258.1.9	Work area is prepared in accordance with work requirements and site procedures
		258.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
258.2	Test wiring systems	258.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		258.2.2	Wiring systems are tested using appropriate plans, drawings and texts in accordance with the work plan
		258.2.3	Wiring systems are tested in conjunction with others involved in, or affected by, the work in accordance with the work plan
		258.2.4	Wiring systems, including enclosures/ supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		258.2.5	Fixed wiring is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications
258.3	Test piping and tubing systems	258.3.1	Required isolations are confirmed where appropriate in accordance with site requirements
		258.3.2	Piping and tubing systems are tested using appropriate plans, drawings and text in accordance with the work plan
		258.3.3	Piping and tubing systems are tested in conjunction with other involved in or affected by the work in accordance with the work plan

Elements		Performance criteria	
		258.3.4	Piping and tubing systems, including enclosures/supports, are inspected prior to testing to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		258.3.5	Fixed piping and tubing is tested as appropriate and results/observations are interpreted and documented to confirm compliance with job specifications and the work plan
258.4	Test the equipment	258.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		258.4.2	Equipment is tested using appropriate plans, drawings and text in accordance with the work plan
		258.4.3	Equipment is tested in conjunction with other involved in or affected by the work in accordance with the work plan
		258.4.4	Required test conditions are confirmed and the equipment is inspected to ensure absence of any damage, defects and/or signs of deterioration in accordance with the work plan
		258.4.5	Equipment is tested using appropriate test techniques in accordance with the work plan
		258.4.6	Equipment test results/observations are interpreted and documented to confirm compliance with job specifications
258.4	Commission the equipment	258.4.1	Required isolations are confirmed where appropriate in accordance with site requirements
		258.4.2	Equipment is commissioned using appropriate plans, drawings and text in accordance with the work plan
		258.4.3	Equipment is commissioned in conjunction with others involved in, or affected by, the work in accordance with the work plan

Elements		Performance criteria	
		258.4.4	Equipment is set up in accordance with operational requirements/manufacturer's specifications
		258.4.5	Testing and monitoring procedures are followed and results monitored, interpreted and documented to ensure equipment operates/functions within specifications
		258.4.6	Equipment is commissioned with due regard being paid to plant security and capacity in accordance with the work plan
		258.4.7	Final job inspection is carried out and permits relinquished as required in accordance with the work plan
258.5	Complete the work	258.5.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		258.5.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		258.5.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		258.5.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 9.2 of the Electrical Contractors Industry Association Competency Standards (Instrumentation Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Systems may include process control systems, PLCs, hydraulic control systems, turbine supervisory systems, water ingress protection system, flame surveillance systems, compressor surge control systems and fire detection/suppression systems

Wiring systems can refer to cords and cables such as flexible multi-core, thermocouple, coxial, ribbon and hook up cable, signal and data cable, ducts such as PVC and metal, trunking, condults and fittings such as PVC and metal (rigid and flexible) pipes, elbows, bends, tees, junction boxes, hose terminators, saddles, spacers, bushes, adaptors and locknuts, wire loom support, cable ties, unistrut, trays and ladder racks

Piping and tubing systems may refer to piping/tubing, piping/tubing enclosures, fittings and support systems

Components may include power supplies, relays, PLC input/output blocks, printed circuit boards, protection devices, switches, transformers, servo valves, positioners, converters, controllers, function cards and transmitters

Test and measurement instruments may include multimeter, standard gases, decade box, DC, I/V standard, potentiometer, radiation meter, hand-held communicator/programmer, frequency counter, function generator, CRO, LCR bridge, logic analyser and specialised test equipment

Fixed wiring tests can refer to polarity, loop impedance and continuity

Fixed piping and tubing tests can refer to leak and continuity

Monitoring equipment can refer to test recorder/data logger

Work may be performed with equipment on-line

Work completion details may include plant and maintenance records, job cards, check sheets and on device labelling updates.

Work site environment may be affected by nearby plant or processes, e.g. heat, noise, dust, oil, water and chemical

Isolations can refer to electrical/mechanical or other associated processes

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Attainment of electrical licence, where appropriate, deeming competency associated with electrical work

Preparation and planning of work

Testing techniques

Commissioning techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; General layout of plant/work site and operation of its equipment; Operating principles of the equipment; Testing and commissioning procedures and techniques; Operational requirements of the equipment; Instrumentation systems; Regulatory aspects; Electrical fundamentals; Test and measurement instruments; Circuit plan appreciation; Distributed control; Programmable control; Communication principles

The ability to:

Apply occupational health and safety standards; Follow relevant statutory regulations and codes of practice; Apply relevant Australian standards; Locate and interpret plans, drawings and text; Use tools and relevant equipment; Use test and measurement instruments; Inspect and test the wiring systems; Inspect and test piping and tubing systems; Inspect, test and monitor equipment; Commission the equipment; Identify and select materials for the job; Apply regulatory aspects theory; Apply electrical fundamentals theory; Carry out work completion details; Update plans, drawings and text; Apply distributed control theory; Apply programmable control theory; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG259 A
Terminate Fibre Optic Cables

Descriptor: This unit refers to the termination of fibre optic cables to equipment including, but not limited to, digital process controllers, distributive control systems, process computers, complex fire/security systems

Elements		Performance criteria	
259.1	Plan and prepare for the work	259.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		259.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		259.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		259.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		259.1.5	Correct size, type and quantity of materials/components are determined, obtained and inspected for compliance with the job specifications
		259.1.6	Work is planned in detail including sequencing and prioritising and considerations made, where appropriate, for the maintenance of plant security and capacity in accordance with system/site requirements
		259.1.7	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		259.1.8	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		259.1.9	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		259.1.10	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
259.2	Install and secure the cable	259.2.1	Required isolations are confirmed where appropriate in accordance with site requirements
		259.2.2	Cable enclosures/support systems are assembled/positioned, secured and installed in conjunction with others involved in or affected by the work in accordance with the work plan
		259.2.3	Cable is positioned, secured and labelled for identification in accordance with appropriate plans, drawings and texts
		259.2.4	Cable is installed in conjunction with others involved in, or affected by, the work in accordance with the work plan
259.3	Terminate fibre optic cables	259.3.1	Fibre optic cable ends are prepared using appropriate techniques in accordance with the work plan
		259.3.2	Fibre optic cores are clearly identified using appropriate labelling or colour coding in accordance with the work plan
		259.3.3	Fibre optic ends are prepared with due regard to maintaining the integrity of cladding material in accordance with the work plan
		259.3.4	Terminations are optically sound and assembled in accordance with job specifications
		259.3.5	Integrity of buffer/cladding and adjoining fibres is maintained during termination procedures in accordance with the work plan
		259.3.6	Final job inspection is completed and any permits relinquished in accordance with the work plan

Elements		Performance criteria	
259.4	Complete the work	259.4.1	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements
		259.4.2	Work area is cleared of waste, cleaned, restored and secured in accordance with site/enterprise procedures
		259.4.3	Plant, tools and equipment are maintained and stored in accordance with site/enterprise procedures
		259.4.4	Work completion details are finalised in accordance with site/enterprise procedures

Range Statement

Stream: Production Plant

Field: Maintenance

Equivalencies: This unit of competence is based on unit 5.9 of the Electrical Contracting Industry Award Standards Project (Electrical Stream)

Inspection should be planned with the appropriate parties to determine access, conditions and work requirements

Enclosures can refer to ducts, trunking and conduits

Support systems can refer to cable ties, trays and ladder racks

Materials may include fibre optics such as plastic, glass; single or multimode, single or multicore, sheathed or unsheathed; fibre optic switches, index matching gels; solvents such as index gel remover; polishing films, connectors such as simplex, duplex, splices and transceivers and couplers

Tools may include hand and portable power tools and specialist tools such as cleaning tool, composite material shears and polishing plates

Work completion details may include plant and maintenance records, job cards, check sheets, on-device labelling updates

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Austel Licensing requirements

Preparation and planning of work

Optic cable installation techniques and procedures

Termination of fibre optic techniques and procedures

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Isolation procedures; Installation and termination procedures; Regulatory aspects; Regulatory aspects; Circuit plan appreciation; Fibre optic procedures; Fibre optic wiring systems; Communication principles Communication principles

The ability to:

Apply occupational health and safety standards; Apply relevant Australian standards; Follow relevant statutory regulations and codes of practice; Locate and interpret plans, drawings and text; Use specialised tools and relevant equipment; Identify and select materials for the job; Install fibre optic cables; Terminate fibre optic cables; Carry out work completion details; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG260 A
Write Programs for Control Systems

Descriptor: This unit refers to the writing of programs from flow charts for electronic control systems

Elements		Performance criteria	
260.1	Plan and prepare for the work	260.1.1	Work requirements are identified from request/work orders or equivalent and clarified/confirmed with appropriate parties or by site inspection
		260.1.2	Occupational health and safety standards, statutory requirements, relevant Australian standards, codes of practice, manufacturers' specifications, environmental requirements and enterprise procedures are identified, applied and monitored throughout the work procedure
		260.1.3	Resources required to satisfy the work plan are identified, obtained and inspected for compliance with the job specifications
		260.1.4	Relevant plans, drawings and texts are selected and interpreted in accordance with the work plan
		260.1.5	Work is planned in detail including sequencing, prioritising and considerations made where appropriate for the maintenance of plant security and capacity in accordance with system/site requirements
		260.1.6	Coordination requirements, including requests for isolations where appropriate, are resolved with others involved, affected or required by the work
		260.1.7	Potential hazards are identified and prevention and/or control measures are selected in accordance with the work plan and site procedures
		260.1.8	Work area is prepared in accordance with work requirements and site procedures

Elements		Performance criteria	
		260.1.9	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
260.2	Write and load programs	260.2.1	Test and measurement instruments, software packages are selected and used to enable completion of the program writing in accordance with the work plan
		260.2.2	Appropriate plans, drawings and text are selected to enable program writing for the control system in accordance with the work plan
		260.2.3	Programming data is written with sequence and variables determined as being in accordance with the desired operating parameters of the control system
		260.2.4	Test and measurement instruments, software packages are selected and used to enable the program to be loaded in accordance with the work plan
260.3	Test operating parameters	260.3.1	Test and measurement instruments, software packages to allow the testing of operating parameters are selected and used in accordance with the work plan
		260.3.2	Appropriate plans, drawings and text and the written program are used to confirm programming data in accordance with the work plan
		260.3.3	Sequence and variables are tested to confirm the desired operating parameters of the control system are met
260.4	Complete the work	260.4.1	Documentation of the programming is performed and presented to appropriate personnel in accordance with the work plan
		260.4.2	Work procedures are modified and evaluated where necessary in accordance with new program documentation
		260.4.3	Work is completed and appropriate personnel notified in accordance with site/enterprise requirements

Range Statement

Stream:	Production Plant
Field:	Maintenance
Equivalencies:	This unit of competence is based on 10.1 of the Electrical Contracting Industry Award Standards Project (Electronic Stream)

Control system can refer to a combination of equipment such as programmable controllers (with complete mathematical functions, data manipulation, proportional, integral and derivative functions); PLCs and distributive control systems

Programming data can refer to programs written in machine code, assembled and compiled language levels

Text can refer top manufacturer's specifications and instruction sets, programming flow charts, complete DOS reference manuals and software programming/interfacing sheets

Test and measurement instruments may refer to a 150MHz multi-channel storage cathode ray oscilloscope, logic analyser and portable VDU

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparation and planning of work

Writing and loading programmes

Testing of operating parameters

Completion of work procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Occupational health and safety standards; Relevant statutory requirements and codes of practice; Relevant Australian standards; Equipment and material required to perform the work; Performance and function of the system; Test and measurement instruments; Programming; Programmable control systems; Distributive control; Software packages; Communication principles

The ability to:

Apply occupational health and safety standards; Apply relevant Australian standards; Follow relevant statutory requirements and codes of practice; Locate and interpret plans, drawings and text and software packages; Write programmes; Load programmes; Use test and measurement instruments; Carry out documentation; Communicate effectively; Apply data analysis techniques and tools.

UTP NEG266 A
Operate and Monitor Supervisory, Control and Data Acquisition Systems

Descriptor: This unit refers to the monitoring and operations of screen based supervisory, control and data acquisition systems

Elements		Performance criteria	
266.1	Operate screen displays	266.1.1	Safety issues are identified in accordance with enterprise/system requirements
		266.1.2	System requirements are identified from relevant personnel and documentation
		266.1.3	Screen displays and applications are identified and retrieved in accordance with system requirements
		266.1.4	Functions available from the screen based equipment are identified and selected in accordance with system procedures
		266.1.5	Functions available from the screen based equipment are utilised in accordance with system requirements
		266.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
266.2	Monitor and interpret information	266.2.1	Screen displays are monitored in accordance with enterprise/system procedures
		266.2.2	Abnormal values are identified by analysis of information obtained from screen displays in accordance with enterprise/system procedures
		266.2.3	Corrective action taken is in accordance with enterprise/system procedures
		266.2.4	Alarms are acknowledged, prioritised and responded to in accordance with enterprise/system procedures

Elements		Performance criteria	
266.3	Enhance screen display	266.3.1	Requirements for the development of new screen displays are identified and confirmed in accordance with system requirements
		266.3.2	New screen displays are researched, assessed and confirmed with appropriate personnel in accordance with system requirements

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted HV operators

Operating environment may be remote from plant and equipment being operated

Displays and functions may include trends, alarms, generation plant, fuel supplies, remote plant and equipment, substations, power distribution network, transmission network, stakeholder systems, multiple screens, multiple windows, linkage between screens, trending facilities, index searches, formats, colours, tags, key commands, dedicated keys and alarms

Faults and abnormal operating conditions may include hardware and software faults and system failures

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

The full range of displays and applications available is explained

Operation of screed based equipment

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Relevant plant and equipment, it's location and operating parameters; Equipment status; Enterprise recording procedures; Communication principles; Control and data acquisition systems; Computers and software; Supervisory, alarm, protection and control equipment

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Operate screen based equipment; Identify equipment status; Plan and prioritise work; Communicate effectively; Apply data analysis techniques and tools; Identify and respond to abnormal equipment operating conditions; Use diagrams, drawings and symbols.

UTP NEG267 A
Operate and Monitor System Equipment

Descriptor: This unit refers to the operation, monitoring and control of H.V. apparatus on the system, via scada control

Elements		Performance criteria	
267.1	Plan and prepare work	267.1.1	Safety issues are identified in accordance with enterprise/system requirements
		267.1.2	System requirements are identified from relevant personnel and documentation
		267.1.3	System and associated equipment operational prerequisites are identified and established in accordance with manufacturers and/or enterprise/site procedures
		267.1.4	Sequence for recommissioning of equipment is identified and determined in accordance with enterprise/system requirements
		267.1.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
267.2	Operate system equipment	267.2.1	The equipment is operated in accordance with enterprise/system procedures/programs
		267.2.2	Load shedding requirements are identified, selected and monitored during equipment operations to ensure system integrity
		267.2.3	Operations are carried out in consultation with appropriate personnel in accordance with enterprise/site requirements
267.3	Monitor system equipment	267.3.1	Voltage and current requirements are assessed, evaluated and controlled to maintain system integrity and stability
		267.3.2	Equipment is monitored for normal operations or to detect deviations in accordance with system procedures
		267.3.3	Corrective actions to rectify abnormalities are undertaken in accordance with system procedures

Elements		Performance criteria	
		267.3.4	Appropriate personnel are notified when defects and/or abnormal operating conditions are detected in accordance with operating procedures
267.4	Analyse equipment faults	267.4.1	Cause of equipment operating faults are identified by analysing the technical and operational information in a logical and sequential manner
		267.4.2	Operation of protection system is identified and assessed to evaluate the nature and cause of fault conditions
		267.4.3	Communication is established with other authorities and/or key stake holders to identify nature/source of equipment fault/ failure
		267.4.4	Corrective action taken is in accordance with enterprise/site procedures
		267.4.5	Network/system integrity and personnel safety are maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation and contingency plans
267.5	Complete documentation	267.5.1	Documentation is updated and maintained and equipment problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Equipment may include machines, circuit breakers, tap changers, protection settings, capacitor/condenser banks, switch gear, generators and transformers

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation, national standards for plant and environmental legislation.

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli, local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, public address system, computer (electronic mail) and operating log (written or verbal)

Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted HV operators

Operations may be continuous operation or during inclement or otherwise harsh weather conditions or during night periods

Faults and abnormal operating conditions may include control equipment failure/malfunctions, loss of electrical supply to plant and equipment, loss of transmission components, system limitations due to location, weather conditions, natural disasters, accidents, temperature and power swings

Key indicators may include voltage, current, reactive power flows, load, equipment. loading limits and system node points

Voltage control may include synchronous compensatory, generation VAR output, capacitor/condenser, tap changers and system configuration

System integrity may include machine and system instability, transmission line and transformer overloading, incorrect tap changer position, protection settings, voltage transformer selection, synchronising, required load shedding and capacitor/condenser bank selection

Operational prerequisites may include switching programmes, pre-operational checks and plant status

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Planning and preparing for work

Operating system equipment

Monitoring system equipment

Analysing equipment faults

Knowledge of implications of actions

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Relevant plant and equipment, it's location and operating parameters; Equipment status; Enterprise recording procedures; Communication principles; Control and data acquisition systems; Computers and software; Supervisory, alarm, protection and control equipment

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Operate screen based equipment; Identify equipment status; Plan and prioritise work; Communicate effectively; Apply data analysis techniques and tools; Identify and respond to abnormal equipment operating conditions; Use diagrams, drawings and symbols.

UTP NEG268 A
Operate and Monitor Communications System

Descriptor: This unit refers to the application of communications systems

Elements		Performance criteria	
268.1	Select and use equipment	268.1.1	The appropriate medium for communication is determined from analysis of available options, previous communication or current circumstances and used in accordance with enterprise guidelines, manufacturer's and/or site requirements
		268.1.2	Communication procedures for opening, passing and receiving messages are conducted to enterprise/site requirements
		268.1.3	Communication equipment is used in accordance with manufacturer's and enterprise/site procedures
		268.1.4	Limitations of communication links are identified and alternatives considered
		268.1.5	Communication is conveyed logically, concisely and articulately in a manner appropriate to the situation to satisfy job requirements
		268.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
268.2	Monitor communication system	268.2.1	Data acquisition is monitored and assessed for quality and action taken in accordance with enterprise/site procedures
		268.2.2	Effectiveness of communication, including understanding of the intent and content, is confirmed between the parties in accordance with site requirements
		268.2.3	The need for communication assistance is identified and addressed in accordance with job requirements
268.3	Complete documentation	268.3.1	Documentation is updated, logs maintained and equipment problems, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Medium for communications may include facsimile, telephone, radio, other electronic medium, memo, letter, report form, log book, switchboard, e-mail, pager, intercom, CB, poster, personal contact, signal and body language

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communication procedures may include protocol, appropriate forms/log books, telephone answering procedure and radio procedure

Limitations may be radio/mobile phone dead spots, weather conditions, customer language barriers, customers lack of technical knowledge and incoherent or irate callers

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Acknowledging and prioritising fault communication

Selecting and applying communication systems

Monitoring communication systems

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Relevant plant and equipment, it's locations and operating parameters; Enterprise recording procedures; Policies; Alternative communication links; Communication systems and principles; Computers and software

The ability to:

Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Communicate information or instructions in a clear and concise manner; Plan and prioritise work; Co-ordinate the operation of equipment to maintain plant integrity, personnel safety and continuity of supply; Apply alternative communication links; Communicate effectively; Apply data analysis techniques and tools; Operate and monitor communication systems.

UTP NEG269 A
Liaise with Stake Holders

Descriptor: This unit refers to the communication between staff and external/internal stake holders

Elements		Performance criteria	
269.1	Prepare for communication	269.1.1	Communication requirement is identified, from previous communication or current circumstances, and confirmed
		269.1.2	The appropriate tone for communication is determined from analysis of previous communication or current circumstances
		269.1.3	The appropriate medium for communication is determined from analysis of available options, previous communication or current circumstances and used in accordance with enterprise guidelines, manufacturer's and/or site requirements
		269.1.4	Information is provided according to urgency and importance
		269.1.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
269.2	Communicate in writing	269.2.1	Written communication is structured to provide or request information in accordance with site requirements
		269.2.2	Appropriate format is identified, from analysis of available options and current circumstances, in accordance with site requirements
		269.2.3	Communication is presented logically, concisely and legibly to satisfy job requirements
		269.2.4	Information dissemination is adhered to in accordance with enterprise policy
		269.2.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training

Elements		Performance criteria	
269.3	Communicate orally	269.3.1	Oral communication is structured to provide or request information in accordance with site requirements
		269.3.2	Communication is conveyed logically, concisely and articulately in a manner appropriate to the situation to satisfy job requirements
		269.3.3	Effectiveness of communication, including understanding of the intent and content, is confirmed between the parties in accordance with site requirements
		269.3.4	Information dissemination is adhered to in accordance with enterprise policy
269.4	Use communications systems	269.4.1	Communications system is used in accordance with enterprise guidelines, manufacturer's and/or site requirements
269.5	Complete documentation	269.5.1	Documentation is updated, maintained and equipment problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Core

Equivalencies: N/A

Key stake holders may include controllers/coordinators, oncoming shift change, support staff, asset centres, patrolmen, customers, clients, other enterprise departments, co-generation staff, other government bodies, line crews, security staff, contractors, field operators, supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted HV operators

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Medium for communications may include facsimile, pager, telephone, radio, memo, letter, report form, log book, switchboard, e-mail, intercom, CB, posters, personal contact, signals and body language

Policies may include operating procedures, land rights, operating conditions, codes of practice. availability roster, fuel supply policy, information security and asset security contractor arrangement

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Communicating and identifying key stake holders

Communicating effectively in writing and/or orally

Using communication systems

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Identifying stake holder requirements; Two way radio capabilities, uses and procedures; Electronic mediums procedures; Documentation procedures; Enterprise policies

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment and its operating parameters; Communicate effectively; Use appropriate communication mediums; Adapt the form of communication to anticipated contexts and audiences.

UTP NEG270 A
Maintain and Utilise Records

Descriptor: This unit refers to the maintenance and use of recorded data

Elements		Performance criteria	
270.1	Maintain records	270.1.1	The appropriate recording tool is selected in accordance with job requirements
		270.1.2	Information is recorded and/or updated, using appropriate techniques, in accordance with work requirements
		270.1.3	Recording requirements are identified and assessed in accordance with work requirements
		270.1.4	Records are created in accordance with work requirements
		270.1.5	Records are stored in an appropriate manner in accordance with work requirements
		270.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
270.2	Retrieve records	270.2.1	Records are retrieved and interrogated in accordance with work requirements
		270.2.2	Source of information/records is selected in accordance with work requirements
		270.2.3	Required information/records are selected in accordance with work requirements

Range Statement

Stream: Production Plant

Field: Core

Equivalencies: This unit of competency incorporates unit 2.2c11 of The National Metal and Engineering Competency Standards

Recording tools may include memos, log sheets, screen displays, graphs, PC, outage reports, operations whiteboard, SCADA trending, printer, system diagrams, diaries, chart recorders, data loggers and D.A.S.

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Records may include operating events, regular data acquisition, memos, explanations, recommendations, system diagrams, verbal reports, visual comparison and statistics

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Acquiring and analysing information relevant for recording

Maintaining records

Retrieving records

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Enterprise recording procedures; External recording systems; Screen based data; Communication principles

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Acquire and analyse information.; Plan and prioritise work; Record information; Use diagrams, drawings and symbols; Retrieve information; Communicate effectively.

UTP NEG271 A
Manage the Network/System

Descriptor: This unit refers to the management of a network/system. systems may be interconnected, remote or isolated

Elements		Performance criteria	
271.1	Plan and prepare network operations	271.1.1	Information and documentation to determine network/system status is assessed and evaluated in accordance with system requirements
		271.1.2	Network/system and associated equipment operational pre-requisites are established in accordance with enterprise/system procedures
		271.1.3	Sequence for recommissioning of network sections and equipment is identified and determined to suit existing circumstances in accordance with enterprise/system procedures
		271.1.4	Forecast prediction is based on the accurate interpretation and analysis of relevant information in accordance with system procedures
		271.1.5	Network/system limitations and performance due to location and external influences are identified
		271.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
271.2	Manage and control network /system.	271.2.1	Network/system is operated in accordance with enterprise/system operating procedures
		271.2.2	Network/system demand is met with contingencies in place to maintain quality of supply standards in accordance with statutory requirements
		271.2.3	Network/system voltage and current requirements are assessed, evaluated and controlled to maintain stability and system integrity
		271.2.4	Voltage/load profiles are identified and adhered to minimising transmission losses

Elements		Performance criteria	
		271.2.5	Network/system load shedding sequence and priorities are monitored to ensure system integrity
		271.2.6	Network/system data is monitored for normal operation or to detect deviations
		271.2.7	Corrective actions to rectify abnormalities are implemented following analysis of data in accordance with system procedures
		271.2.8	Resources required to meet system requirements are identified and co-ordinated in accordance with system procedures
		271.2.9	Where required, operations are carried out in consultation with team members
271.3	Analyse and respond to network/ system faults or incidents	271.3.1	Causes of abnormal network/system operating conditions are identified by analysing the technical and operational information in a logistical and sequential manner
		271.3.2	Operation of protection systems are identified and assessed to evaluate the nature and cause of fault conditions.
		271.3.3	Communication may be established with other authorities and/or key stake holders to identify nature/source of system interference
		271.3.4	Corrective action is taken in accordance with enterprise/system procedures
		271.3.5	Network/system integrity and personnel safety are maintained through consultation with appropriate personnel and reference to plant technical, operational documentation and contingency plans
271.4	Review incident response and preventative procedures	271.4.1	Incident responses are assessed and reviewed in accordance with system procedures
		271.4.2	Alternative responses/contingencies are identified and assessed in accordance with system procedures
		271.4.3	Alternative responses/contingencies are documented and approved in accordance with system procedures

Elements		Performance criteria	
271.5	Complete documentation	271.5.1	Documentation is updated, log sheets maintained and equipment/system problems, movements abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Core

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Systems may be interconnected, remote or isolated

Technical and operational indicators may include local indicators and recorders, computers and alarms (visible and or audible)

Key indicators may include voltage, current, reactive power flows, load, equipment loading limits, system node points, frequency and plant status

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel, team members/other authorities may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller, field operators, restricted operators, emergency personnel, network controllers/coordinators, generation controllers, plant operators, field operators, support staff, fire service, police, ambulance, emergency services, enterprise and site representatives, consumers and independent power producers

Equipment may include machines, circuit breakers, tap changers, protection settings, capacitor/condenser banks, generators and SCADA systems

Voltage control may be synchronous compensator, generation VAR output, capacitor/condenser, switchgear, tap changers and network configuration

System integrity may be affected by machine and system stability, transmission line and transformer overloading, correct tap changer position, protection settings, voltage transformer selection, synchronising, required load shedding selected, capacitor/condenser bank selection, loss of network and generation components

System limitations may include location, weather conditions, natural disasters, accidents, temperature and power swings

Contingencies may include responsive spinning reserve, spare/stand-by plant and load shedding

Types of incidents may include localised blackout, interconnected/isolated power system potential power system threat, accidents, life threatening situations, generation plant and auxiliary plant faults/failure, loss of network and generation components

Team members/other authorities may include network controllers/coordinators, generation controllers, plant operators, field operators, support staff, fire service, police, ambulance, emergency services, enterprise and site representatives, consumers and independent power producers

System condition may be voltage profiles, spare plant, generation/transmission capability limits, deviation from generation schedule, variation from normal trends, plant testing, switching programs and responsive spinning reserve

Unit operations may include spurious faults in automatic systems, automatic systems operating out of range, failure of automatic system components and routine plant movement.

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Relevant system type

Preparing for system operations

Managing and controlling a Network/System operation

Coordination requirements

Analysing and responding to faults and abnormal system operating conditions

Impact of actions

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement, stating the type of system applicable to the application of work. The type of system is to be detailed in a unit qualifier following the Unit Title (Type A)

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; System/Network types and characteristics; Contingency plans; Problem solving ; Supervisory, alarm, protection and control equipment; Switchgear operation; Load shedding principles; Communication principles; Control and data acquisition systems; Computers and software; Switching practices and procedures

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Manager and control system/network; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Identify and respond to abnormal system operating conditions; Plan and prioritise work; Co-ordinate the operation of system/network to maintain plant integrity, personnel safety, continuity of supply and optimum efficiency; Use diagrams, drawings and symbols; Apply stress management techniques; Direct and co-ordinate personnel; Select appropriate load shedding; Apply diagnostic techniques.

UTP NEG272 B
Manage Critical Incidents

Descriptor: This unit refers to the management of incidents of a critical nature that may impact on the operational effectiveness of the plant or system, endanger human life or property, or have an adverse impact on the environment

Elements		Performance criteria	
272.1	Identify critical incident and consequences	272.1.1	Information and documentation to determine system status is assessed and evaluated in accordance with system requirements
		272.1.2	Fault location is determined by establishing, monitoring and evaluating system configuration and operational pre-requisites in accordance with enterprise procedures
		272.1.3	Fault information is collated in accordance with procedures to evaluate type and cause of failure
		272.1.4	System limitations and performance, including location and external influences, are identified
		272.1.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
272.2	Stabilise the system/s	272.2.1	Appropriate response techniques are identified and used in accordance with requirements.
		272.2.2	Appropriate personnel and external stake holders are consulted with in accordance with enterprise procedures prior to further action
		272.2.3	Implications of personnel and key stake holder actions are monitored and analysed
		272.2.4	System requirements are assessed, evaluated and controlled to maintain stability and system integrity
		272.2.5	Corrective actions to rectify abnormalities are implemented following analysis of data in accordance with system procedures

Elements		Performance criteria	
272.3	Restore the system	272.3.1	Specialised assistance is identified and attended to where required in accordance with enterprise procedures
		272.3.2	Strategies to restore system integrity are identified, evaluated and communicated in accordance with procedures to appropriate personnel
		272.3.3	Restoration strategy is undertaken, monitored, evaluated and adjusted in accordance with procedure
272.4	Review response to incident and instigate preventative procedure	272.4.1	Effectiveness of response is evaluated in accordance with system procedures
		272.4.2	Stake holder responses and perspective of incident are obtained, recorded and analysed
		272.4.3	Alternative responses/contingencies are identified and assessed in accordance with system procedures
		272.4.4	Incident and alternative preventive measures are documented in accordance with procedures
		272.4.5	Improvements for managing future critical incidents are recommended and approved
		272.4.6	Relevant findings are communicated to appropriate key stake holders

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation, national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel, team members/other authorities may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller, field operators, restricted operators, emergency personnel, network controllers/coordinators, generation controllers, plant operators, field operators, support staff, fire service, police, ambulance, emergency services, enterprise and site representatives, consumers and independent power producers

Operating environment may be: remote from plant and equipment being operated (operation is assisted by remote indicators of plant status and other parameters monitored), during inclement or otherwise harsh weather conditions, in wet/noisy/dusty areas or during night periods

Unit operations may include spurious faults in automatic systems, automatic systems operating out of range, failure of automatic system components and routine plant movement

Types of incident may include localised blackout, interconnected/isolated power system potential power system threat, accidents, life threatening situations, generation plant and auxiliary plant faults/failure and loss of network and generation components

System conditions may be: voltage profiles, spare plant, generation/transmission capability limits, variation from normal trends and switching

Documentation may include policy, procedure, standard operating instructions, contingency plans and emergency switching programs

Liaison with key stake holders may be system/network controllers/coordinators, oncoming shift change, field operators, support staff, asset centres, patrolmen, customers, other government bodies, co-generation authorities, generation plant operators, on call staff, police, fire and emergency services and private systems

Post incident debrief may be: probable fault/failure cause, strategic/contingency plan, environmental implications, economic factors, policy, procedure, training, safety factors and emergency switching programs

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparing for system stabilisation

Stabilising and restoring system operations

Coordination requirements

Identifying and responding to abnormal system operating conditions

Policies for system incident and follow up procedures

Generation/transmission capability limits

Impact of actions

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Relevant plant and equipment, it's locations and operating parameters; Enterprise recording procedures; System/network characteristics; Contingency plans; Supervisory, alarm, protection and control equipment; Switchgear operation; Load shedding principles; Communication principles; Control and data acquisition systems; Computers and software; Switching practices and procedures

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Manager and control system/network; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Identify and respond to abnormal system operating conditions; Plan and prioritise work; Co-ordinate the operation of system/network to maintain plant integrity, personnel safety, continuity of supply and optimum efficiency; Use diagrams, drawings and symbols; Apply stress management techniques; Direct and co-ordinate personnel; Select appropriate load shedding; Apply diagnostic techniques.

UTP NEG273 A
Schedule Generation

Descriptor: This unit relates to the scheduling of generation plant to economically meet forecast demand

Elements		Performance criteria	
273.1	Forecast load profile	273.1.1	Comprehensive information on all variables which have the potential to affect demand is obtained and employed to enable a realistic forecast
		273.1.2	Information integrity is confirmed and recorded, and deficiencies are detected and rectified
		273.1.3	Forecast prediction is based on the interpretation and analysis of relevant information
		273.1.4	Forecast outcomes are produced in a time frame that enables system security and economic operation criteria to be maintained
		273.1.5	Forecast prediction is continuously assessed against real time trends and adjustments made where applicable
		273.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
273.2	Identify unit availability and capability	273.2.1	Unit status information is sought with sufficient regularity to maintain the integrity of scheduling plans
		273.2.2	Information integrity is confirmed and deficiencies are detected and rectified
		273.2.3	Information is processed and recorded in a time frame that enables effective scheduling
		273.2.4	Comprehensive information on all factors which have the potential to affect the unit status is obtained
		273.2.5	Effective relationships are cultivated and maintained with remote/independent power generators

Elements		Performance criteria	
273.3	Prepare generation unit schedules	273.3.1	Base load generation is scheduled in accordance with contractual obligations and enterprise procedures
		273.3.2	Peak load generation is scheduled to meet system demand and maintain adequate spinning reserve capability
		273.3.3	Units are operated in economic merit within the framework of the enterprise fuel strategies
		273.3.4	Megawatts and megavar spinning reserve criteria are met at all times in accordance with local instructions
		273.3.5	System security criteria are met at all times in accordance with enterprise procedures
		273.3.6	Quality of supply standards are met at all times in accordance with statutory requirements
		273.3.7	Plant maintenance commitments are incorporated in setting priorities for committing units
		273.3.8	Schedule is produced with sufficient lead time to allow effective plant movements to occur
		273.3.9	Power station plant problems are accurately assessed in terms of impact on unit commitment and scheduling requirements
		273.3.10	Plant testing commitments are incorporated in setting priorities for committing units

Elements		Performance criteria	
273.4	Implement generation unit schedules	273.4.1	Circumstances resulting in unexpected changes to demand are identified and managed in accordance with system requirements
		273.4.2	Transmission system losses are identified and minimised in accordance with system procedures
		273.4.3	Transmission and generation system status changes are identified and accommodate in accordance with system procedures
		273.4.4	Fuel supply status changes are identified and accommodated in accordance with system procedures
		273.4.5	Generation outputs are monitored in accordance with system procedures
		273.4.6	Power station plant problems are assessed in terms of impact on unit commitment and scheduling requirements in accordance with system procedures
		273.4.7	System fault levels and transmission plant load levels are identified and not exceeded in accordance with system procedures
		273.4.8	Scheduling of units is timed to optimise system efficiency in accordance with system procedures
		273.4.9	Scheduling information is recorded and communicated to all stake holders in accordance with system procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Stations/generation plant may include main power station, remotely controlled power station, independent power producers, single and multiple generating sets and interconnected/isolated power systems

Safety standards may include relevant sections of occupational health and safety legislation, relevant state and federal legislation, national standards for plant and enterprise safety rules

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include local indicators and recorders and computers

Communications may be by means of telephone, two way radio, pager, computers (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator, independent generators and fuel suppliers

Strategies and resources may include fuel, quality of supply, contract and commitments

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Forecasting load profiles

Identifying unit status

Preparing generation schedules

Implementing generation schedules

Operating and loading characteristics of generation plant

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Enterprise recording procedures; Systems operating instructions; Relationships that weather, social and industrial variables have on system demand; Economic operating criteria including fuel strategies; Communication principles; Computers and software

The ability to:

Apply relevant occupational health & safety regulations.; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Schedule plant within design parameters to meet demand; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Plan and prioritise work; Co-ordinate the scheduling of generating units to maintain optimum system efficiency; Apply appropriate diagrams and symbols.; Operate screen based equipment.

UTP NEG274 A
Plan a Scheduled Outage

Descriptor: This unit refers to the process of planning an outage

Elements		Performance criteria	
274.1	Identify outage requirements	274.1.1	Outage requirements are identified from notification of requirement, work orders or equivalent and clarified with the appropriate parties and/or site inspection
		274.1.2	Safety issues are identified to comply with statutory enterprise and site requirements
		274.1.3	Date, time and expected duration of outage is assessed and confirmed
		274.1.4	Schematic diagrams, drawings, plans and/or maps are consulted to determine area affected
		247.1.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
274.2	Create outage plan	274.2.1	Statistical records are consulted to ascertain most favourable time for outage
		274.2.2	Implications of outage are identified and assessed to ascertain impact of outage
		274.2.3	Identify key stake holders and/or equipment affected
		274.2.4	Current status of affected equipment and consumers is identified and assessed
		274.2.5	Consult with all key stake holders to determine whether contingency plans require implementation and/or timetables require review is carried out in accordance with enterprise policy
		274.2.6	Disruptions to key consumers are minimised by providing alternative routes of supply
		274.2.7	Scope of work to be carried out during outage is evaluated against the allocated time frame.
		274.2.8	Types of permits required to undergo work prior to and during outage are established in accordance with enterprise procedures

Elements		Performance criteria	
		274.2.9	Notification of requirement or other pre-emptive request is approved in accordance with enterprise procedures
274.3	Implement outage plan	274.3.1	Work crews are notified of the outage plan through the appropriate channels in accordance with enterprise procedures
		274.3.2	Notification of outage is communicated to all stake holders in accordance with enterprise procedures
274.4	Complete documentation	274.4.1	Documentation is updated, files and records maintained in accordance with enterprise/site procedures.

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communications may be by means of telephone, two way radio, pager, computers (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent and system/network controllers

Type of scheduled outages may be distribution/network H.V. bus section, generation plant, major auxiliary plant, fuel supply, L.V. switchboards and transmissions

Consumers and key stake holders may include domestic customers, essential services, police, fire service, emergency services, local councils, corporate enterprises, industry, internal enterprise management, operators, controllers, maintenance personnel, contractors and independent power utilities

Notification may include television, radio, newspaper, mail, telephone, e-mail memos and notices

Documentation may include operations project file, records, reports, computers, memos, notification of requirement and work orders

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Investigating and understanding implications of outage

Identifying and advising key stake holders

Identifying outage requirements

Creating outage plans

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Environmental awareness; Relevant plant and equipment, it's location and operating parameters; Knowledge of system/s; Consumer requirements/ commitments; Contractual obligations; Essential consumers; Computations and use of statistics; Communications principles; Computers and software

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Plan and prioritise work; Use diagrams, drawings, plans, maps and symbols; Draft interruption notices; Communicate with public and key stake holder.

UTP NEG275 A
Manage Local H.V. Networks

Descriptor: This unit refers to the local control and management of HV substations and/or local networks

Elements		Performance criteria	
275.1	Plan and prepare work	275.1.1	Documentation to determine substation/ network status is assessed and evaluated
		275.1.2	Substation and local network equipment operational prerequisites are established in accordance with manufacturers and enterprise/site procedures
		275.1.3	Sequence for operating network section and equipment is determined to suit existing circumstances in accordance with enterprise/site requirements
		275.1.4	Relevant information to forecast and plan responses for efficient operation is utilised
		275.1.5	Regular consultation with key stake holders is maintained and requirements recognised
		275.1.6	Implications of operators actions to the system are identified and assessed
		275.1.7	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
275.2	Operate, monitor and control local network	275.2.1	The local system is operated in accordance with enterprise/site operating procedures
		275.2.2	Local network voltage and current requirements are assessed and evaluated to maintain stability and system integrity
		275.2.3	Voltage/load profiles are identified and adhered to in accordance with enterprise operating procedures
		275.2.4	Corrective actions to rectify abnormalities are implemented following analysis of data in accordance with manufacturer's and system procedures
		275.2.5	Resources required are identified and co-ordinated to meet system requirements

Elements		Performance criteria	
		275.2.6	Operations are carried out in consultation with team members in accordance with system procedures
275.3	Analyse and respond to local network/system faults or incidents	275.3.1	Cause of fault conditions are identified by analysing the technical, operational information and in consultation with system control
		275.3.2	Operation of protection systems is identified and assessed to evaluate the nature and cause of fault conditions
		275.3.3	Communication is established with other authorities and/or key stake holders to identify nature/source of system interference (where required)
		275.3.4	Corrective action is taken in accordance with enterprise/system procedures
		275.3.5	Local system integrity and personnel safety are maintained through consultation with appropriate personnel and reference to plant technical, operational documentation and contingency plans
275.4	Review incident response and preventative procedures	275.4.1	Incident responses are assessed and reviewed in accordance with system procedures
		275.4.2	Alternative responses/contingencies are identified and assessed in accordance with system procedures
		275.4.3	Alternative responses/contingencies are documented and approved in accordance with system procedures
275.5	Complete documentation	275.5.1	Documentation is updated, log sheets maintained and equipment/system problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures.

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include local indicators and recorders, computers and alarms (visible and or audible)

Key indicators may include voltage, current, reactive power flows, load, equipment loading limits, system node points and plant status

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system/network controller, field operators and restricted H.V. operators

Voltage control may be capacitor/condenser, switchgear, tap changers and network configuration

Network implications may include system stability, line and transformer overloading, correct tap changer position, protection settings voltage transformer selection and synchronising

Network limitations may include location, weather conditions, natural disasters, accidents, temperature and power swings

System conditions may include voltage profiles, spare plant, line capacity limits, variations from normal trends, plant testing and switching programs

Plant and equipment may include circuit breakers, tap changers, protection settings, capacitor/condenser banks, overhead switchgear, underground switchgear, transformers, protection indicators and substations.

Operating environment may be remote from plant and equipment being operated (operation is assisted by remote indicators), during inclement or harsh weather conditions, in wet/noisy/dusty areas or during night periods

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparing for system operations

Managing and controlling system operations

Coordination requirements

Identifying and responding to abnormal system operating conditions

Impact of actions

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; System/network characteristics; Contingency plans; Supervisory, alarm, protection and control equipment; Switchgear operation; Communication principles; Control and data acquisition systems; Computers and software; Switching practices and procedures

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Manager and control system/network; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Identify and respond to abnormal system operating conditions; Plan and prioritise work; Co-ordinate the operation of system/network to maintain plant integrity, personnel safety, continuity of supply and optimum efficiency; Use diagrams, drawings and symbols; Apply stress management techniques; Direct and co-ordinate personnel; Select appropriate load shedding; Apply diagnostic techniques.

UTP NEG276 A
Interpret and Analyse Protection Operation

Descriptor: This unit refers to the interpretation and analysis of the operation of high voltage protection schemes and related low voltage protection

Elements		Performance criteria	
276.1	Respond to protection operation	276.1.1	Protection operation is confirmed in accordance with enterprise procedures
		276.1.2	Apparatus affected is identified in accordance with enterprise procedures
		276.1.3	Targets, flags and alarms are identified and recorded in accordance with enterprise/site procedure
		276.1.4	Relevant stake holders are advised in accordance with enterprise procedures
		276.1.5	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
276.2	Interpret and determine cause of protection operation	276.2.1	External information is managed and communication with external stake holders is conducted and recorded in accordance with enterprise procedures
		276.2.2	Information is collated and assessed in a logical and sequential manner in accordance with enterprise procedures
		276.2.3	Sequence of events prior to and following protection operation is identified and assessed in accordance with enterprise procedures
		276.2.4	Multiple protection operations are assessed and evaluated in accordance with enterprise procedures
		276.2.5	Findings are analysed in conjunction with protection type and recorded data, to determine most probable cause of protection operation

Elements		Performance criteria	
276.3	Restore protection	276.3.1	All relevant stake holders are informed of findings and plan of action in accordance with enterprise procedures
		276.3.2	Relevant protection indicators are reset in accordance with enterprise procedures
		276.3.3	Corrective action is taken according to fault type in accordance with enterprise/site procedures
276.4	Complete documentation	276.4.1	Records are maintained and all events and operations are logged in accordance with enterprise procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Protection may include restricted earth fault, frame leakage, over current (instantaneous/inverse definite minimum time), earth fault (instantaneous/inverse definite minimum time), sensitive earth fault, phase differential, transformer differential, pilot wire differential, busbar differential, phase failure, under frequency load shedding, over voltage, bucholtz, winding temperatures, auto recloser, oil circuit recloser, air circuit recloser, directional earth fault, back up timer, reverse power, generator earth/fault, auto trip, distance protection, general equipment H.V. protection and related L.V. protection

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, giving or receiving direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator, restricted H.V. operators, independent generators and customers

Operating environment may be remote from plant and equipment being operated, (operation is assisted by remote indicators of plant status and other parameters monitored), during inclement or otherwise harsh weather conditions, in wet/noisy/dusty areas or during night periods

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Responding to protection equipment operation

Interpreting and determining cause of equipment operation

Restoring protection

The knowledge of protection equipment and schemes

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Responding to protection equipment operation; Interpreting and determining cause of equipment operation; Restoring protection; The knowledge of protection equipment and schemes

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Identify plant status; Communicate effectively; Apply data analysis techniques and tools; Apply diagnostic techniques; Apply or determine appropriate corrective actions required; Plan and prioritise work; Use plans, drawings and symbols; Recognise abnormal plant/system/equipment operating conditions; Evaluate protection operastion and determine the appropriate response.

UTP NEG277 A
Operate H.V. Primary Switchgear

Descriptor: This unit refers to the local operation of high voltage primary circuit breaking devices

Elements		Performance criteria	
277.1	Prepare to operate primary switchgear	277.1.1	Work requirements are identified and clarified/confirmed with appropriate parties in accordance with enterprise procedures
		277.1.2	Procedures/safety precautions when operating H.V. circuit breakers are identified and recognised in accordance with enterprise procedures
		277.1.3	Identify circuit breaker type and determine correct operating procedure in accordance with enterprise procedures
		277.1.4	Examine and assess circuit breaker condition for safe operation in accordance with enterprise procedures
		277.1.5	Suppress related protection if and where necessary in accordance with enterprise procedures
		277.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
277.2	Operate circuit breaker	277.2.1	Mechanical operation and limitations of the equipment are identified in accordance with enterprise procedures
		277.2.2	Implications of actions are identified and recognised in accordance with enterprise procedures
		277.2.3	Circuit breaker is operated and confirmation that required status has been achieved is given in accordance with enterprise procedures
		277.2.4	Racking, testing, isolation, circuit earthing and reinstatement procedures are carried out to manufacturer's instructions and enterprise/site procedures

Elements		Performance criteria	
		277.2.5	Confirm test equipment integrity and prove circuit de-energised in accordance with operating procedures
277.3	Validate circuit breaker integrity	277.3.1	Equipment inspected for safe operation in accordance with enterprise procedures
		277.3.2	Circuit breaker environment is inspected to ensure all statutory requirements are met
		277.3.3	Confirm circuit breaker operates in accordance with manufacturer's specifications
277.4	Complete documentation	277.4.1	Documentation is updated, log sheets maintained and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures.

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Equipment includes vacuum circuit breaker, oil circuit breaker, gas circuit breaker, air circuit breaker, phasing sticks, earthing trucks, gloves, testers, earths and discharge equipment (personal safety equipment)

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail), operating logs (written or verbal) and intercoms

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted H.V. operators

Implications may be safety of personnel and public, damage to equipment, loss of plant, legal implications, system integrity, capital cost, lost enterprise revenue and community costs

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparation for switchgear operations

Operation and knowledge of circuit breakers

Implications of circuit breaker operations

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Circuit breaker operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Consequences of operator actions; H.V. power systems and parameters; H.V. protection schemes; Enterprise procedures; Circuit breaker construction and operation; Isolation and earthing procedures; Communication principles

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate circuit breaker within design parameters; Identify plant status; Prepare equipment for operation; Communicate effectively; Recognise abnormal circuit breaker operation; Plan and prioritise work; Use plans, diagrams and symbols; Operate protection equipment; Isolate and earth; Apply enterprise procedures.

UTP NEG278 A
Develop Contingency Plans

Descriptor: This unit refers to the preparation of contingency plans required to support the integrity of the enterprise

Elements		Performance criteria	
278.1	Identify contingencies	278.1.1	Contingencies are identified from an analysis of functions which are critical to the performance of the team/enterprise
		278.1.2	Contingencies are arranged in order of recommended priority and the contingencies to be planned are agreed with by appropriate delegate
278.2	Identify preferred contingency options	278.2.1	Options for satisfying contingency needs are identified from analysis of critical functions
		278.2.2	Preferred contingency option is identified following a detailed analysis of the human, fiscal and material factors of alternative options
		278.2.3	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
278.3	Develop contingency plan	278.3.1	Contingency plan is prepared and documented to include objective, methodology, resource requirements and coordination requirements
		278.3.2	Approval for the plan is obtained in accordance with enterprise procedures
		278.3.3	Contingency plan information is provided to appropriate personnel for implementation
		278.3.4	Contingency plans are updated to reflect changes to enterprise requirements
278.4	Complete documentation	278.4.1	Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator, restricted H.V. operators and external stake holders

Safety standards may include relevant sections of occupational health and safety legislation, relevant state and federal legislation, national standards for plant and enterprise safety rules

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communications may be by means of telephone, two way radio, pager, computer (electronic mail)and operating logs (written or verbal)

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Identifying contingency options

Developing contingency plan

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant operating parameters; Environmental awareness; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Development techniques; Enterprise policy; Enterprise procedure; System limitations; Communication procedures; Computers and software

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Communicate effectively; Use data analysis techniques and tools; Use diagnostic techniques; Plan and prioritise work; Use plans, drawings and symbols; Develop contingency plans.

UTP NEG279 A
Manage Operational Crisis to Maintain/Restore Power System Integrity

Descriptor: This unit refers to the management of a crisis of a magnitude which affects the integrity and effectiveness of the system

Elements		Performance criteria	
279.1	Identify crisis	279.1.1	Crisis and probable implications are identified and assessed in accordance with enterprise procedures
		279.1.2	Secondary threats to situation are identified and monitored in accordance with enterprise procedures
		279.1.3	The system configuration and/or generation capability is evaluated in accordance with enterprise procedures
		279.1.4	Data determining network/system and/or generation status is assessed and evaluated in accordance with enterprise procedures
		279.1.5	External information is received, collated and assessed in accordance with enterprise procedures
		279.1.6	Probable cause of crisis is identified from available information and resources
		279.1.7	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
279.2	Establish contingency plan	279.2.1	Contingency plans are identified using relevant enterprise documentation and procedures
		279.2.2	Requirements for additional resources are identified in accordance with enterprise procedures
		279.2.3	Alternate contingencies to cater for crisis variations are developed in consultation with team members

Elements		Performance criteria	
279.3	Establish communications	279.3.1	Communication links with appropriate external authorities for coordination of their resources are established in accordance with enterprise procedures
		279.3.2	Communication with appropriate key stake holders is established to disseminate information in accordance with enterprise procedures
		279.3.3	Customers are dealt with in accordance with enterprise policy and procedure
		279.3.4	Team roles, both internal and external, are identified and conveyed to appropriate personnel in accordance with enterprise procedures
279.4	Manage crisis	279.4.1	Response is managed in accordance with enterprise/site requirements and allowances for personnel/equipment limitations are made
		279.4.2	Events and responses are prioritised taking into account needs of stake holders in accordance with enterprise procedures
		279.4.3	Impact of secondary threats are identified and assessed in accordance with enterprise procedures
		279.4.4	Contingency plans are actioned in accordance with enterprise/site policy and procedure
		279.4.5	Additional resources are co-ordinated and directed in accordance with enterprise procedures
		279.4.6	Restoration strategies are monitored, evaluated and adjusted as necessary in accordance with enterprise procedures
		279.4.7	Systems are stabilised and integrity maintained in accordance with enterprise procedures

Elements		Performance criteria	
279.5	Document and review crisis and response	279.5.1	Equipment failure/problems are recorded and processed in accordance with enterprise procedures
		279.5.2	Feedback from stake holders is recorded and analysed in accordance with enterprise procedures
		279.5.3	Required reports and findings are generated and distributed to appropriate personnel in accordance with enterprise procedures
		279.5.4	Improvements to the crisis management process are recommended to the appropriate parties in accordance with enterprise procedures
		279.5.5	Alternative contingencies are analysed and recommendations are communicated to appropriate personnel in accordance with enterprise procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, relevant state and federal legislation, national standards for plant and enterprise safety rules

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; equipment and alarm manuals and external stake holder agreements

Communications may be by means of telephone, two way radio, pager, computer (electronic mail), operating logs (written or verbal) and intercoms

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, power plant operations personnel, police, fire brigade, ambulance, emergency services, interconnected equipment personnel, public relations, management and system/network controllers

Operating environment may be remote from plant and equipment being operated (operation is assisted by remote indicators of plant status and other parameters monitored) during inclement or otherwise harsh weather conditions, in wet/ noisy/dusty areas, during night periods, continuous operation, during periods of stress, fatigue, work pressures, external influence (plant and people) and during high level intense work environment

Types of incidents may include blackout, interconnected/isolated power system potential power system threat, disasters, accident, life threatening situations, generation plant and auxiliary plant faults/failures, system blacks, cyclone, multiple faults, floods, secondary threats, high winds and extreme electrical storms

Key indicators are voltage, current, reactive power flows, load, equipment, loading limits, system node points and appropriate external indicators, e.g. radar

System implications are machine and system stability, transmission line and transformer overloading, correct tap changer position, protection settings, voltage transformer selection, synchronising, required load shedding selected and capacitor/confessor bank selection

System conditions may be: voltage profiles, spare plant, generation/transmission capability limits, variation from normal trends and switching

Documentation may include policy, procedure, standard operating instructions, contingency plans and emergency switching programs

Liaison with key stake holders may be system/network controllers/coordinators, oncoming shift change, field operators, support staff, asset centres, patrolmen, customers, other government bodies, co-generation authorities, generation plant operators, on call staff, police, fire, emergency services, private systems and independent power producers

Post incident debrief may be probable fault/failure cause, strategic/contingency plan, environmental implications, economic factors, policy, procedure, training, safety factors and emergency switching programs

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

The knowledge of emergency procedures

The knowledge of the roles of external authorities/bodies

The ability to establish and control emergency situations

The ability to apply tactical decision making techniques

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Environmental awareness; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Equipment starting pre requisites; Supervisory, alarm, protection and control equipment; Auxiliary plant and plant operation; Computers and software; External authorities/bodies role; Independent generators; Communication equipment; Communication principles

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate plant within design parameters; Identify plant status; Communicate effectively; Apply diagnostic techniques; Apply data analysis techniques and tools; Recognise abnormal plant operating conditions; Apply or determine appropriate corrective actions required; Plan and prioritise work; Maintain generator unit integrity; Interpret remote indication of plant status and condition; Use plans, diagrams, drawings and symbols; Delegate to and manage staff; Apply stress management techniques.

UTP NEG280 A
Control Hydro Generation/Pumping

Descriptor: This unit refes to the remote control of hydro plant

Elements		Performance criteria	
280.1	Maintain key indicator limits	280.1.1	Pond levels, station discharges, machine voltage and current limits, frequency, time error (where applicable) are maintained in accordance with manufacturer's specifications and enterprise requirements
		280.1.2	Hydro plant is run at peak efficiency, or to the load schedule avoiding rough running zones in accordance with enterprise procedures
		280.1.3	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
280.2	Operate remote hydro plant	280.2.1	Machines are remotely stopped, started, loaded and unloaded in accordance with the operating regimes dictated by the generation schedule
		280.2.2	Plant is remotely switched in and out of synchronous condenser operation (where required) in accordance with system requirements
280.3	Maintain policy and procedure	280.3.1	Procedures to alert public of increased river flows are adhered to in accordance with site/enterprise procedures
		280.3.2	Minimum river flows are maintained in accordance with agreed limits
		280.3.3	Water storage levels are monitored and maintained in accordance with statutory or policy guidelines
280.4	Complete documentation	280.4.1	Documentation is updated, maintained and equipment problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted H.V. operators

Operating environment may be remote from plant and equipment being operated and operation is assisted by remote indicators of plant status and other parameters monitored

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

The knowledge of procedures that affect recreational, rural and commercial users of waterways and storages

The operation of remote hydro plant

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Equipment status; Plant operating parameters; Environmental awareness; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Communication principles; Computers and software

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Operate plant within design parameters; Apply relevant environmental legislation; Identify plant status; Prepare plant/equipment for operation; Communicate effectively; Apply data analysis techniques and tools; Recognise abnormal plant operating conditions; Apply or determine appropriate corrective actions required; Plan and prioritise work; Co-ordinate the operation of equipment to maintain plant integrity, personnel safety, continuity of supply and optimum efficiency; Interpret remote indication of plant status and condition.; Interpret and apply reading of appropriate diagrams and symbols, data and alarms.

UTP NEG281 A
Develop H.V. Switching Programs

Descriptor: This unit refers to the development of switching programs where multiple sources of supply must be considered & managed

Elements		Performance criteria	
281.1	Interpret requirements	281.1.1	Notification of requirement is confirmed and assessed
		281.1.2	Area of planned outage is identified using system diagrams, drawings and/or maps, in consultation with appropriate personnel
		281.1.3	Planned work details are interpreted from outage request or equivalent and stated on the draft program
		281.1.4	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
281.2	Research switching programme	281.2.1	Implications of switching program on the system are identified and recognised
		281.2.2	Types and function of switchgear to be operated are identified and their suitability for operation under forecast system conditions during scheduled outage is assessed
		281.2.3	System loadings, limitations and alternate supply route capabilities are evaluated to ensure system integrity
		281.2.4	Consultation with appropriate parties affected by the switching programme is undertaken in accordance with enterprise procedures
		281.2.5	Consideration is given to geographical and/or site location of isolation points to conclude shortest possible route when determining sequence of switching steps in order to minimise outage time
		281.2.6	Isolated work area is appraised to ensure safe working clearances are maintained in accordance with mandatory regulations and enterprise/site requirements

Elements		Performance criteria	
		281.2.7	H.V., L.V. and control circuitry is examined to ensure no back-feed to work is possible
281.3	Draft switching program	281.3.1	Draft is formatted in logical sequential steps, stating location, apparatus, apparatus ID and operation to be conducted
		281.3.2	Permit to work procedures are entered at correct step in program
		281.3.3	Program is planned to ensure access, work and reinstatement take place in a logical and sequential manner
		281.3.4	Switching program is checked for errors and omissions in accordance with enterprise procedures
		281.3.5	All documentation supporting the program is filled out requirements in accordance with enterprise procedures
281.4	Validate program	281.4.1	Switching program is forwarded to appropriate personnel for checking and verification in accordance with enterprise procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Program may include operations where primary and secondary isolations are required to isolate a work area, operations where switching involves multiple and interconnecting power generating utilities, commissioning/isolating/ parallelling zone sub station plant, transmission systems, bus sections, zone transformers and interconnected power supplies.

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, network/system controllers, field operators, line workers, external customers, project leaders and authorising officer

Secondary isolations may include VTs, UPS supply, control systems, plant auxiliaries and DC supplies

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Researching switching programmes

Drafting switching programmes

Validation procedures

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Electrical theory principles ; Interconnected utilities systems and equipment; Network systems; Protection systems; Isolating, tagging and earthing procedures; Control systems; Communication principles; Computers and software

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Identify plant status; Communicate effectively; Use data analysis techniques and tools; Apply or determine appropriate corrective actions required; Plan and prioritise work; Interpret and apply reading of appropriate diagrams and symbols; Apply electrical principles/theory to derive HV switching programs; Write switching programmes.

UTP NEG282 A
Operate H.V. Secondary Switchgear

Descriptor: This unit refers to the local operation of high voltage secondary switchgear

Elements		Performance criteria	
282.1	Prepare to operate primary switchgear	282.1.1	Work requirements are identified and clarified/confirmed with appropriate parties in accordance with enterprise procedures
		282.1.2	Procedures/safety precautions when operating H.V. switch gears are identified and recognised in accordance with enterprise procedures
		282.1.3	Location of switchgear is determined from appropriate drawings, plans and maps
		282.1.4	Identify switch gear type and determine correct operating procedure in accordance with enterprise procedures
		282.1.5	Examine and assess switch gear condition for safe operation in accordance with enterprise procedures
		282.1.6	Suppress related protection if and where necessary in accordance with enterprise procedures
		282.1.7	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
282.2	Operate switch gear	282.2.1	Mechanical operation and limitations of the equipment are identified in accordance with enterprise procedures
		282.2.2	Implications of actions are identified and recognised in accordance with enterprise procedures
		282.2.3	Switch gear is operated and confirmation that required status has been achieved is given in accordance with enterprise procedures
		282.2.4	Racking, testing, isolation, circuit earthing and reinstatement procedures are carried out to manufacturer's instructions and enterprise/site procedures

Elements		Performance criteria	
		282.2.5	Confirm test equipment's integrity and prove circuit de-energised in accordance with operating procedures
282.3	Validate switch gear integrity	282.3.1	Equipment inspected for safe operation in accordance with enterprise procedures
		282.3.2	Switch gear environment is inspected to ensure all statutory requirements are met
		282.3.3	Confirm switch gear operates in accordance with manufacturer's specifications
282.4	Complete documentation	282.4.1	Documentation is updated, log sheets maintained and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Equipment may include air insulated single phase/three phase link operated URD switchgear, oil immersed ring main switch (RMU) metal clad, compact switching station, load break elbows and oil immersed rotary switch, ring main switch SF6 metal clad, arc chute air break switch, horn deflecting air break switch, sectionalises, expulsion drop outs and H.V. links

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail), operating logs (written or verbal) and intercom

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted H.V. operators

Implications may be safety of personnel and public, damage to equipment, loss of plant, legal implications, system integrity, capital cost, lost enterprise revenue and community costs

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

The preparation for switchgear operations

The operation and knowledge of switch gears

The implications of switch gear operations

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Switch gear operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Consequences of operator actions; H.V. power systems and parameters; H.V. protection schemes; Enterprise procedures; Switch gear construction and operation; Isolation and earthing procedures; Communication principles

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate switch gear within design parameters; Identify plant status; Prepare equipment for operation; Communicate effectively; Recognise abnormal switch gear operation; Plan and prioritise work; Use plans, diagrams and symbols; Operate protection equipment; Isolate and earth; Apply enterprise procedures.

UTP NEG283 A
Operate H.V. Condition Changing Apparatus

Descriptor: This unit refers to the local operation of all high voltage condition modifying devices

Elements		Performance criteria	
283.1	Prepare for operations	283.1.1	Procedures and safety requirements/limits for operating condition changing devices are adhered to in accordance with manufacturers enterprise/site and statutory requirements
		283.1.2	Location of apparatus is determined from plans, drawings, system diagrams and where appropriate maps
		283.1.3	Identification of device to be operated is identified and confirmed
		283.1.4	Condition and status of apparatus to be safely operated is determined visually
		283.1.5	Prepare device for operation in accordance with enterprise procedures
		283.1.6	Device to be operated is verified with key stake holders, using appropriate procedures and guidelines, in accordance with enterprise policy
		283.1.7	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
283.2	Operate condition changing device	283.2.1	Contact with stake holders is maintained throughout and communication is concise and clear
		283.2.2	System conditions are evaluated prior to operation in accordance with enterprise procedures
		283.2.3	Device is operated to manufacturer's instructions and enterprise policy and guidelines in accordance with enterprise procedures
		283.2.4	Device is controlled and adjusted in order to alter system conditions to achieve desired outcome

Elements		Performance criteria	
		283.2.5	Apparatus is examined to ensure device has functioned correctly
		283.2.6	System conditions are re-evaluated to confirm desired outcome
		283.2.7	Apparatus is secured in accordance with operational procedure and policy
		283.2.8	Confirmation procedure is conducted after operation in accordance with enterprise policy
283.3	Complete documentation	283.3.1	Documentation is updated, equipment problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures.

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Apparatus/devices may include on load transformer tap changers, off load transformer tap changers, capacitor banks, rotary converters, voltage regulators, rectifiers and transformers

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail), operating logs (written or verbal) and intercom

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, system controller/network controller, field operator and restricted H.V. operators

Operating environment may be remote from plant and equipment being operated (operation is assisted by remote indicators of plant status and other parameters monitored), during inclement or otherwise harsh weather conditions, in wet/ noisy/dusty areas or during night periods

System parameters may include voltage, current, frequency, VAR load and equipment capability

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparing for operating apparatus

Operating H.V. apparatus

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Enterprise procedures; H.V. systems and interconnected circuitry; Communication principles

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Locate relevant plant and equipment; Operate equipment within design parameters; Identify plant status; Prepare equipment for operation; Communicate effectively; Recognise abnormal switch gear operation; Plan and prioritise work; Apply enterprise procedures.

UTP NEG284 A
Co-ordinate and Direct Switching Program

Descriptor: This unit refers to the coordination and direction of resources when managing a switching program

Elements		Performance criteria	
284.1	Prepare for switching program	284.1.1	Qualifications/authorisations of personnel performing switching operations are established
		284.1.2	Occupational health & safety standards, statutory/enterprise regulations, codes of practice and environmental requirements are identified, applied and monitored throughout the program
		284.1.3	Contingency plans are evaluated and discussed with appropriate stake holders and, where necessary, amendments are relayed to all relevant parties
		284.1.4	Permits and access requirements are established prior to program commencement
		284.1.5	Documentation is distributed to relevant parties prior to program commencement
		284.1.6	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
284.2	Direct switching program	284.2.1	All parties involved in switching program are advised and directed to locations
		284.2.2	Communication is established with all involved parties and maintained throughout duration of program
		284.2.3	System schematic diagram or equivalent is updated as program proceeds
		284.2.4	Access to plant is controlled in accordance with enterprise/site policy
		284.2.5	Work groups are co-ordinated and directed in accordance with enterprise procedures
		284.2.6	Permits issued are monitored and recorded in accordance with enterprise procedures
		284.2.7	Switching program is controlled to ensure outage coincides with planned timetable

Elements		Performance criteria	
284.3	Maintain dynamic integrity of system	284.3.1	Switching program steps are verified before and after each operation
		284.3.2	Steps are logged upon successful completion of each operation
		284.3.3	System conditions/stability is constantly monitored in accordance with system requirements
		284.3.4	Alternative program steps are quickly and accurately developed if/when unexpected problems occur
284.4	Complete documentation	284.4.1	Documentation is updated and equipment problems, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer's operation and maintenance manuals; and equipment and alarm manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, two way radio, pager, computer (electronic mail), operating logs (written or verbal), faxes and reports

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent, power plant operations personnel or equivalent, technical and engineering officers or equivalent, maintenance staff, other operating staff or equivalent, high voltage operators, restricted high voltage operators, testers in charge, testers, recipient in charge, recipients, contractors and system/network operators

Work parties may include enterprise personnel and contractors

Operating environment may be remote from plant and equipment being operated (operation is assisted by remote indicators of plant status and other parameters monitored), during inclement or otherwise harsh weather conditions, in wet/ noisy/dusty areas or during night periods

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Preparing for switching programs

Directing and coordinating switching programs

Monitoring system integrity and stability

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Switching operations and procedures; System diagrams; Systems (network); Communication principles; Computers and software

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Identify plant status; Communicate effectively; Acquire and analyse information relevant to system operation; Recognise abnormal plant/system operating conditions; Determine appropriate corrective actions required; Plan and prioritise work; Acquire and analyse information relevant to system operation; Recognise abnormal plant/system operating conditions; Determine appropriate corrective actions required.

UTP NEG285 A
Co-ordinate Power Generation

Descriptor: This unit refers to the operation and control of multiple generators sharing load under the control of one operator in an isolated system

Elements		Performance criteria	
285.1	Plan for plant operation	285.1.1	Safety issues are identified to comply with enterprise/site requirements
		285.1.2	Work, plant and resource requirements are identified from relevant information and documentation
		285.1.3	Pre operational checks are carried out in accordance with enterprise and site requirements
		285.1.4	Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
285.2	Operate generator and excitation system	285.2.1	System is operated in accordance with enterprise/site and manufacturer's operating procedures
		285.2.2	Synchronising requirements are assessed, evaluated and achieved to ensure machine/system stability during synchronising
		285.2.3	System is monitored and observed to detect deviations from normal operating conditions
		285.2.4	Corrective actions are taken to rectify abnormalities in accordance with manufacturer's and enterprise/site procedures
285.3	Control generation of electrical energy	285.3.1	Generator output is adjusted to meet demand whilst observing operating requirements
		285.3.2	Reactive power generation and voltage regulation requirements are assessed and the system is controlled to achieve the desired output

Elements		Performance criteria	
		285.3.3	Generator stabilities and operating limits are assessed and the system is controlled to maintain those limits tin accordance with enterprise/site and manufacturer's procedures
		285.3.4	Generator cooling systems and limits are monitored and assessed and excitation system is controlled to maintain those limits in accordance with enterprise/site and manufacturer's procedures
285.4	Co-ordinate generation control	285.4.1	Load sharing between multiple generators is controlled to maintain optimum efficiency and plant reliability
		285.4.2	Output of generators is adjusted to meet demand whilst observing operating requirements
		285.4.3	System/plant key indicators are monitored and adjusted to maintain within limits and detect deviations from normal operating conditions
		285.4.4	Corrective actions taken to rectify system abnormalities are in accordance with manufacturer's, enterprise/site requirements
		285.4.5	System integrity, personal safety and continuity of supply are maintained throughout.
		285.4.6	Consultation with appropriate personnel is undertaken as required in accordance with enterprise/ site requirements.
		285.4.7	Systems are operated at optimum efficiency
285.5	Monitor system/plant	285.5.1	System/plant to be monitored is physically identified
		285.5.2	System/plant is monitored for normal operation or to detect deviations
		285.5.3	Corrective action taken is in accordance with enterprise/site procedures
		285.5.4	Appropriate personnel are notified when defects and abnormal operating conditions are detected

Elements		Performance criteria	
285.6	Analyse system/plant faults	285.6.1	Causes of abnormal system operating conditions are identified by analysing the technical and operational information in a logical and sequential manner
		285.6.2	Actions necessary to rectify fault are correctly determined
		285.6.3	System/plant integrity and personnel safety are maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation
		285.6.4	Appropriate personnel are arranged for local investigation of identified operational abnormalities
285.7	Complete documentation	285.7.1	Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Range Statement

Stream: Production Plant

Field: Operations

Equivalencies: N/A

Key indicators may include frequency time error, bus voltage, machine/ equipment voltage and current limits, plant temperatures, reactive power flows, power factor, generation plant load capabilities, protection settings, visual and audible indicators, analogue and digital displays and load shedding requirements

Systems, plant and equipment may include generator cooling systems; fuel delivery system; generator and generator auxiliary plant; generator excitation system; generation fire protection system; unit co-ordinated control system; generator circuit breaker/transformer; unit auxiliary switchboards; electricity market auto loading procedures prime mover governing system

Safety standards may include relevant sections of occupational health and safety legislation, enterprise safety rules, national standards for plant, relevant state and federal legislation and Australian standards

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; equipment and alarm manuals; dedicated computer equipment; enterprise standing instructions and plant notes; enterprise log books; market load profile forecasts; electricity market bidding information; and manufacturer's operation and maintenance manuals

Technical and operational indicators may include stimuli (audio, smell, touch, visual), remote or local indicators and recorders, computers and alarms (visible and or audible)

Communications may be by means of telephone, facsmile, two way radio, pager, computer (electronic mail) and operating logs (written or verbal)

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent; other coordinators of energy production; other operating staff; technical and engineering officers or equivalent; maintenance personnel; and contractor staff

Operating within an isolated system the environment may be remote from plant and equipment being operated; (operation is assisted by remote indicators of plant status and other parameters monitored); during night periods; during inclement or otherwise harsh weather conditions; and in wet/noisy/dusty areas

Unit operations (systems requirements) may include spurious faults in automatic systems operating out of range, failure of automatic system components and routine plant movement

Evidence Guide

Critical aspects of evidence

The knowledge and application of relevant sections of: Occupational, health and safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

Planning and preparing for one operator isolated plant operations

Operating generator and excitation systems

Controlling and co-ordinate generation of electrical energy

Analysing system faults

Context of assessment

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and work

Interdependent assessment of unit

Nil

Knowledge and Skills

A knowledge of:

Relevant occupational health & safety regulations; Relevant statutory legislation; Relevant enterprise/site safety procedures; Enterprise/site emergency procedures and techniques; Plant status; Plant operating parameters; Relevant plant and equipment, it's location and operating parameters; Enterprise recording procedures; Systems components and interactions

The ability to:

Apply relevant occupational health & safety regulations; Apply relevant statutory legislation; Apply relevant enterprise/site safety procedures; Apply enterprise/site emergency procedures and techniques; Apply enterprise recording procedures; Identify plant status; Prepare plant/equipment for operation; Communicate effectively; Co-ordinate the operation of plant and equipment; Maintain generator unit integrity; Apply principles of electrical generation; Apply data analysis techniques and tools; Recognise abnormal plant operating conditions; Apply or determine appropriate corrective actions required; Plan and prioritise work; Co-ordinate the operation of equipment to maintain plant integrity, personnel safety and continuity of supply; Co-ordinate the operation of equipment to maintain optimum efficiency; Interpret remote indication of plant status and condition; Interpret and apply reading of appropriate diagrams and symbols.