



Australian Government

Department of Education, Employment and Workplace Relations

UETTDRSO15A Operate and monitor system equipment (SCADA)

Release: 1

UETTDRSO15A Operate and monitor system equipment (SCADA)

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor 1)

1.1) Descriptor

This Competency Standard Unit covers the skills and knowledge to operate, monitor and control HV apparatus on the network via SCADA control

Application of the Unit

Application of the Unit 4)

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

1.2) License to practice

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental protection, anti discrimination and training. Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites

Prerequisite Unit(s) 2)

2.1) Competencies

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed:.

UETTDREL05B Respond to Technical
Enquiries and requests

For the full prerequisite chain details for this unit please refer to Table 3 in Volume 1, Part 2

Employability Skills Information

Employability Skills 3)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements: Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1	Plan and prepare for the operation, monitoring and control of system equipment	1.1	OHS practices/procedures and environmental and sustainable energy procedures, which may influence the preparation of the switching program, are reviewed and determined.
		1.2	System requirements are established after data is analysed and expected outcomes of the work are confirmed with the appropriate personnel.
		1.3	System and associated equipment operational prerequisites are identified and established in accordance with manufacturers and/or enterprise/site procedures
		1.4	System monitoring and control procedures are discussed with and/or directed to the appropriate personnel in order to ascertain the project brief.

ELEMENT	PERFORMANCE CRITERIA
1.5	Operational parameters are ascertained from established policies, procedures and specifications.
1.6	Work roles and tasks are allocated according to requirements and individuals' competencies.
1.7	Work is prioritised and sequenced for the most efficient/effective outcome, completed within an acceptable timeframe to a quality standard and in accordance with established procedures.
1.8	Liaison and communication issues with other/authorised personnel, authorities and clients are resolved and activities coordinated to carry out work.
1.9	Risk control measures are identified, prioritised and evaluated against the work schedule.
1.10	Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.
2 Carry out and coordinate the operation, monitoring and control of system equipment	2.1
	OHS and sustainable energy principles, functionality and practices to reduce the incidents of accidents and minimise waste are incorporated into the project in accordance with requirements and/or established procedures.
	2.2
	Decisions concerning the operation, monitoring and control of system equipment are made on the basis of safety and effective outcomes according to requirements and/or established procedures.
	2.3
	The effectiveness of the finished project is analysed as per requirements and established procedures.
	2.4
	Technical advice is given regarding potential hazards, safety risks and control measures so that monitoring and preventative action can be undertaken and/or appropriate authorities consulted, where necessary, in accordance with requirements and established procedures.

ELEMENT**PERFORMANCE CRITERIA**

3	Complete the operation, monitoring and control of system equipment	2.5	Essential knowledge and associated skills are applied to analyse specific data and compare it with compliance specifications to ensure completion of the project within an agreed timeframe according to requirements.
		2.6	Work teams/groups are arranged/coordinated/evaluated to ensure planned goals are met according to established procedures.
		2.7	Solutions to non-routine problems are identified and actioned, using acquired essential knowledge and associated skills, according to requirements.
		2.8	Quality of work is monitored against personal performance agreement and/or established organisational and professional standards.
		3.1	Final review of the operation, monitoring and control of system equipment is undertaken to ensure it complies with all requirements and include all specifications and documentations needed to complete the project.
		3.2	Appropriate personnel are notified of completion and reports and/or completion documents are finalised/commissioned.
		3.3	Reports and/or completion documents are submitted to relevant personnel/organisations for approval and, where applicable, statutory or regulatory approval.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of developing and evaluating transmission switching programs.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

The extent of the essential knowledge and associated skills (EKAS) required is given in Volume 2 - Part 2.2 EKAS. It forms an integral part of this unit.

- E2.18.1 Occupational Health and Safety principles
- E2.18.2 Electrical safe working practice
- E2.3.13 Using supervisory control and data acquisition systems
- E2.4.14 Personal computer operating systems, basics
- E2.4.16 Personal computers, engineering applications software basic
- T2.2.1 Generation power systems
- T2.2.2 Transmission, distribution and rail power systems
- T2.2.3 Substations, power transformers and reactors
- T2.8.1 Enterprises specific policies and procedure instructions
- T2.8.2 Enterprises specific OHS instructions
- T2.8.3 Enterprises specific technical drawing and documents
- T2.9.1 Interpretation of power distribution network drawings and documentation
- T2.10.9 Analyse and interpret results and measurements substations

REQUIRED SKILLS AND KNOWLEDGE

T2.11.18 Discrete protection systems

T2.11.19 Interdependent protection systems

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the Range Statement of the competency standard unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments.

EVIDENCE GUIDE

Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines - UET09". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
 - Demonstrate an understanding of the essential knowledge and associated skills described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
 - Demonstrate an appropriate level of employability skills; and
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	The minimum number of items on which skill is	Item List

EVIDENCE GUIDE

	to be demonstrated	
A	Perform on at least three (3) occasions the following:	Evidence of switching programs involving the operation and monitoring of system equipment via SCADA
B	Perform on at least two (2) occasions the following:	Evidence of unplanned switching events involving the operation and monitoring of system equipment via SCADA
C	Demonstrate the following:	Extract data used in the analysis of network loading trends
D	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual preparation of the monitoring, control and operation of system equipment

Note:

Access will be needed to: relevant modelling tools, drawings, computerised electrical plant control and monitoring facilities and enterprise operational policies, procedures and work practices.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working in realistic environment and

EVIDENCE GUIDE

a variety of conditions.

Method of assessment

9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note:

Competent performance with inherent safe working practices is expected in the Transmission, Distribution and Rail Traction Industry. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

8) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the operation, monitoring and control of system equipment include the following:

Equipment shall include network primary and secondary plant types applicable to the enterprise. This 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/ parameters out of specification, 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,

RANGE STATEMENT

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.

Regulatory and enterprise procedures for the compliance with national electricity code.

The following constants and variables included in the Element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Assessing risk
- Assessment
- Authorisation
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not Applicable

Custom Content Section

2.2) Literacy and numeracy skills

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 "Literacy and Numeracy"

Reading	5	Writing	5	Numeracy	5
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Competency Field

Competency Field	5)
	System Operation Units