

## **UETTDRIS05A Perform substation switching operation to a given schedule**

### **Unit Descriptor**

1)

This Competency Standard Unit covers the conducting of switching operations in a substation in accordance to a given instructions, switching schedule and established enterprises procedures. It encompasses the operation of substation switching devices such as circuit breakers, air break switches, fuses, reclosers, ring main units and isolators.

### **Prerequisite Unit(s)**

2)

#### **Competencies**

2.1)

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

	UETTDRCJ03A	Install and maintain de-energised HV underground paper insulated cables
or	UETTDRCJ07A	Install and maintain de-energised HV underground polymeric insulated cables
or	UETTDRIS02A	Maintain electrical equipment (network infrastructure)
or	UETTDRIS14A	Install and maintain overhead conductors and cables (poles and structures)
or	UETTD RTP09A	Install and maintain overhead conductors and cables (towers)

#### **Literacy and numeracy skills**

2.2)

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      3      Writing      3      Numeracy      3

**Application of the Unit**

3)

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

**License to practice**

3.1)

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.

**Competency Field**

4)

Industry Specific Cross-Discipline Units

**ELEMENT**

**PERFORMANCE CRITERIA**

**5) Elements:** Elements describe the essential outcomes of a unit of competency

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

1 Prepare for substation switching to a given schedule

- 1.1 Switching and work schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
- 1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
- 1.3 OHS policies and procedures related to requirements and established procedures for substation switching are obtained and confirmed for the purposes of the work to be performed and communicated.

- |   |  |   |   |
|---|--|---|---|
|   | 1.4  | Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.   |   |
|   | 1.5  | Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.                    |   |
|   | 1.6  | Relevant authority is obtained to access and perform work according to requirements and/or established procedures.  |   |
|   | 1.7  | Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.   |   |
|   | 1.8  | Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements  |   |
|   | 1.9  | Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.  |   |
|   | 1.10   | Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.                                       |   |
|   | 1.11   | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures. |   |
|   | 1.12   | Road signs, barriers and warning devices are positioned in accordance with requirements.  |   |
| 2 | Carry out substation switching to a given schedule | 2.1   | OHS and Sustainable Energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures. |
|   |  | 2.2   | Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.            |

- |   |   |   |   |
|---|---|---|---|
|   | 2.3   | Apply Essential Knowledge and Associated Skills in the safe substation switching to a given schedule to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements  |   |
|   | 2.4   | Communications with Switching Control Officer are established and maintained throughout the isolation operation according to established procedures.  |   |
|   | 2.5   | Electrical equipment and associated circuits line/network or work site to be switched is isolated and proved de-energised using appropriate devices, earthed where required and load transfer successfully achieved according to requirements and established procedures. |   |
|   | 2.6   | Substation switching to a given schedule is carried out, in accordance with the work schedule and requirements/established procedures.  |   |
|   | 2.7   | Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.   |   |
|   | 2.8   | Unplanned events occurring during substation switching to a given schedule are responded to and undertaken within the scope of established procedures.  |   |
|   | 2.9   | Relevant permits are prepared and issued in accordance with established procedures.   |   |
|   | 2.10  | Known solutions to a variety of problems are applied using acquired Essential Knowledge and Associated Skills.  |   |
|   | 2.11  | On going checks of quality of the work are undertaken in accordance with instructions and established procedures  |   |
| 3 | Complete substation switching to a given schedule | 3.1   | Work undertaken is checked against works schedule for conformance with requirements and anomalies reported in accordance with established procedures. |
|   |   | 3.2   | Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable.                                      |
|   |   | 3.3   | Work site is rehabilitated, cleaned up and made safe in accordance with established procedures.   |

- 3.4 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
- 3.5 Relevant permit(s) are signed off, safety devices are removed, and the system is re-energised and returned to service in accordance with requirements/established procedures.
- 3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel and authority notified.

## **REQUIRED SKILLS AND KNOWLEDGE**

**6) 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 performing substation switching to a given schedule.

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.

- T2.4.1 Switchgear installation
- T2.4.2 Low voltage switching principles
- T2.4.3 High voltage switching principles
- T2.4.4 High voltage fault switching principles
- T2.4.5 High voltage distribution transformer principles
- T2.4.6 High voltage SWER system
- T2.4.7 Feeder automation system

## **RANGE STATEMENT**

**7)** This relates to the unit of competency 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/may be demonstrated in relation to the carrying out of switching operations in a substation in accordance to a given instructions and switching schedule.

Switchgear includes ring main units, circuit breakers, isolators, earth switches, HV links, air break switches, capacitor banks, reactor banks, line/wave traps and fuses. (Refer to Definition 25)

Specialist tools include HV phasing sticks, HV link sticks, HV live-line clamp operating

sticks, HV ground transformer isolating handles and associated earths, HV overhead operating earths and HV detectors.

Switching program/schedule including necessary detail, eg. structure, switch or equipment number; locations; HV feeder; outage times; works plan/order.

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
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- 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
- MSDS
- Notification
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures

- Work clearance systems

## EVIDENCE GUIDE

**8)** This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency 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 components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

### Overview of Assessment

#### 8.1)

Longitude 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. 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**

**8.2)**

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 – UET06”. 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 as 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 skills enabling employment; and
  - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures; and
- Demonstrated performance across a representative range of contexts from the prescribed items below:

<b>Range of tools/equipment/materials/procedures/workplaces/other variables</b>		
<b>Group No</b>	<b>The minimum number of items on which skill is to be demonstrated</b>	<b>Item List</b>
A	All of the following:	Approvals/clearances Access permits
B	All of the following:	Operating sticks Operating earths Voltage detectors

C	All of the following:	Phasing equipment Ground equipment isolating handles and earths
D	Any one of the following:	Links Air break switches Fuses
E	Any two of the following:	Reclosers Ring main units Circuit breakers
F	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**

**8.3)**

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 substation switching to a given schedule.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

**Method of assessment**

**8.4)**

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 Industry to which this Competency Standard Unit applies. 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**

**8.5)**

There are no concurrent assessment recommendations for this unit.

**Key competencies****8.6)**

Evidence that particular key competencies have been achieved within this Competency Standard Unit is in the context of the following Performance Criteria of evidence. See Volume 2, Part 4 for an explanation of Key competencies and levels of this Training Package.

<b>Key competencies</b>	<b>Example of Application</b>	<b>Performance Level</b>
How are ideas and information communicated within this competency?	Refer to the following Performance Criteria for examples of application: 1.2, 1.8, 1.9, 1.11, 2.7, 3.1, 3.2	2
How can information be collected, analysed and organised?	Refer to the following Performance Criteria for examples of application: 1.1, 1.3, 3.1, 3.5, 3.6	2
How are activities planned and organised?	Refer to the following Performance Criteria for examples of application: 1.4, 1.5, 1.6, 1.7, 1.10, 1.12, 2.1, 2.5, 2.6, 2.10, 3.1, 3.2, 3.3	2
How is team work used within this competency?	Refer to the following Performance Criteria for examples of application: 2.3, 2.5, 2.6, 2.10, 3.4	3
How are mathematical ideas and techniques used?	Refer to the following Performance Criteria for examples of application: 1.1, 1.7, 2.2, 2.4, 2.6, 2.9	1
How are problem solving skills applied?	Refer to the following Performance Criteria for examples of application: 1.1, 2.4, 2.8, 2.9, 3.1	2
How is use of technology applied?	Refer to the following Performance Criteria for examples of application: 1.7, 2.2, 2.5, 2.6, 3.6	2

**Skills Enabling Employment****8.7)**

Evidence that competency in this unit incorporates skills enabling employment is in the context of the following performance. See Volume 2, Part 5 for definitions and an explanation of skills enabling employment.

<b>Skills for Employment</b>		<b>Example of Application</b>
1	Developing and using skills within a real workplace	Refer to the following Performance Criteria for examples of application:  1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.11, 2.2, 3.1, 3.3
2	Learning to learn in the workplace	Refer to the following Performance Criteria for examples of application:  1.2, 1.4, 1.7, 1.10, 2.3, 2.5, 2.6, 2.7, 2.8, 2.9, 3.4
3	Reflecting on the outcome and process of work task	Refer to the following Performance Criteria for examples of application:  2.1, 2.5, 2.9, 2.10, 3.1
4	Interacting and understanding of the context of the work task	Refer to the following Performance Criteria for examples of application:  1.2, 1.3, 1.4, 1.7, 1.8, 1.10, 2.1, 2.2, 2.4, 2.7, 2.8, 2.9, 3.1, 3.6
5	Planning and organising the meaningful work task	Refer to the following Performance Criteria for examples of application:  1.1, 1.2, 1.3, 1.4, 1.10, 2.3, 2.4, 2.5, 2.6, 2.7, 3.1
6	Performing the work task in non-routine or contingent situations	Refer to the following Performance Criteria for examples of application:  1.7, 2.4, 2.5, 2.6, 2.7, 2.8, 3.1, 3.2