



Australian Government

UETDRSB016 Maintain synchronous condensers

Release: 1

UETDRSB016 Maintain synchronous condensers

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package Release 4.0.

Application

This unit includes the skills and knowledge required to maintain synchronous condensers in the electricity supply industry (ESI).

It includes synchronous condenser principles including, types, operating constraints, ratings, control systems, excitation and synchronising.

It also includes components, including starters, control and protection systems, substation fundamentals, cooling and lubrication systems.

Note: Entry into this unit is for users who:

- *hold the unit UETDREL005 Work safely in the vicinity of live electrical apparatus or equivalent,*
- and*
- *hold an Electrician licence or the equivalent issued in an Australian state or territory,*
- or*
- *hold an Electrician qualification or the equivalent issued in an Australian state or territory.*

This unit can be undertaken in conjunction with the qualification listed above, provided all requirements for completion of the Certificate III qualification are met prior to issuing this unit.

The application of the skills and knowledge described in this unit may require a licence/registration to practice in the workplace.

Other conditions may also apply under state and territory legislative and regulatory licensing requirements which must be confirmed prior to commencing this unit.

Pre-requisite Unit

Refer to Application.

Competency Field

Substation

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Prepare to maintain synchronous condensers

- 1.1** Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be performed are reviewed and determined
- 1.2** Work plan is obtained, confirmed and communicated with relevant personnel in accordance with workplace requirements
- 1.3** Hazards are identified, risks assessed, and control measures identified and applied
- 1.4** Work is prioritised and sequenced for completion in accordance with work plan and workplace requirements
- 1.5** Plant, tools, equipment and personal protective equipment (PPE) required for work are determined, obtained and confirmed in working order
- 1.6** Liaison and communication issues with authorised personnel, authorities and clients are resolved to facilitate work, as required
- 1.7** Worksite is prepared in accordance with the work plan and workplace requirements

2 Maintain synchronous condensers

- 2.1** Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be performed are applied and monitored
- 2.2** Work permits are received and signed in accordance with workplace requirements
- 2.3** Lifting, working at heights, working in confined spaces and the use of plant, tools, equipment and PPE are carried out in accordance with workplace requirements

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|--|------------|--|
| | 2.4 | Synchronous condensers are maintained in accordance with workplace requirements |
| | 2.5 | Incidents or unplanned events are responded to in accordance with workplace requirements |
| 3 Complete work and documentation | 3.1 | Completed work is checked for compliance against the work plan and workplace requirements |
| | 3.2 | Work permits are signed off in accordance with workplace requirements |
| | 3.3 | Worksite is rehabilitated, cleaned and made safe in accordance with workplace requirements |
| | 3.4 | Plant, tools and equipment are cleaned, checked and returned to storage, and surplus resources and materials are managed in accordance with workplace requirements |
| | 3.5 | Work records, reports and documentation are completed, and where relevant, appropriate personnel notified in accordance with workplace requirements |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UET Transmission, Distribution and Rail Sector Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is not equivalent to UETDRSB31 Maintain high voltage power system synchronous condensers.

Links

Companion Volume Implementation Guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=229bace1-b7bc-4653-9300-dffb13ecfad7>

Assessment Requirements for UETDRSB016 Maintain synchronous condensers

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least two (2) separate occasions and include:

- applying relevant legislation, regulations, standards, codes of practice and organisational workplace requirements including:
 - work health and safety (WHS)/occupational health and safety (OHS) requirements
- identifying hazards, assessing risks, and identifying, applying and monitoring control measures
- obtaining, inspecting and using relevant personal protective equipment (PPE)
- dealing with an unplanned event on at least one (1) occasion
- obtaining and signing relevant work permits in accordance with workplace requirements
- completing relevant work records, reports and documentation
- maintaining at least one (1) of the following windings:
 - stator
 - rotor
- maintaining at least one (1) of the following starter systems:
 - static frequency converter
 - variable speed drive
- maintaining at least one (1) of the following systems:
 - control
 - protection and alarm
 - excitation/automatic voltage regulator (AVR)
- maintaining the following systems:
 - cooling
 - lubrication.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and include knowledge of:

- relevant legislation, regulations, standards, codes of practice and organisational workplace requirements, including WHS/OHS requirements
- hazard, risk assessment and risk control requirements, including potential hazards
- types and application of PPE
- safe use of plant, tools and equipment
- application, purpose and types of permits and access authorities
- events constituting an unplanned event or incident
- procedures for responding to an unplanned event or incident
- workplace records, reports and documentation
- evaluation of equipment serviceability
- identification and procurement of materials and apparatus
- operational manuals and system diagrams
- stator and rotor windings, including:
 - types
 - characteristics
 - maintenance requirements
 - insulation measurement
 - common defects and rectification
- starter systems, including:
 - types
 - characteristics
 - maintenance requirements
 - insulation measurement
 - common defects and rectification
- control systems, including:
 - types
 - characteristics
 - maintenance requirements
 - common defects and rectification
 - excitation/AVR
- protection and alarm systems, including:
 - types
 - characteristics
 - maintenance requirements
 - secondary signal injection tests
 - common defects and rectification
- substation fundamentals, including:
 - transformers
 - on-load tap changers (OLTC)
 - balancing reactive plant

- additional components of synchronous condensers, including:
 - prime mover
 - flywheel
 - starter motor
 - clutch
 - hydraulic/pneumatic starter
 - dynamic braking
- system, plant and component diagrams/plans, drawings and manuals
- specialised tools, including:
 - types, construction and function
 - calibration
 - care and maintenance
- fault conditions and symptoms, including:
 - types and typical fault conditions
 - interpretation of mechanical faults
 - interpretation of electrical faults
 - auxiliary systems
 - protection and alarm systems
- synchronous condenser principles, including:
 - ratings
 - control systems
 - synchronising
 - components and ancillary equipment
 - cooling and lubrication systems
 - types, characteristics and capabilities
 - associated control housings
 - serviceability of components
 - operating constraints.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so.

Where this is not appropriate, assessment must occur in simulated conditions involving realistic and authentic activities that replicate operational workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy

requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, equipment and PPE currently used in industry
- applicable documentation, including workplace requirements, equipment specifications, regulations, codes of practice and operation manuals.

Links

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