

1. Module details**Module name****Service Installations****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 36 – 40 hours.

Module code

NUE235

Discipline code

0703130

2. Module purpose

This module is designed to supply the knowledge and skilled required by electrical supply industry workers to install and maintain low voltage electrical services. The experience gained is in the correct procedures and practices involved in preparing for and carrying out installation and maintenance work on underground and overhead electrical services connecting consumers.

Jointing, terminating and maintaining of energised and de-energised low voltage overhead lines, testing procedures, commissioning and fault diagnoses. All procedures and practices comply in accordance with electricity supply industry standards, Supply Authority regulations, relevant Australian Standards and OH & S regulations.

3. Prerequisites

NE162 Electrical Principles 3.
NUE215 Overhead Conductor Installation (Distribution).

4. Relationship to competency standards

This module addresses Unit 3.5 of the E.S.I. National Competency Standards for overhead Line Work and Cable Jointing and Unit 2.12 & 3.5 of the Electrical Contracting Industry Award Standard (Volume 8).

5. Content**Underground service arrangements and procedures****System diagrams/plans, technical drawings**

interpretation
analysis

Cables

type (polymeric)
characteristics
capabilities

Maintenance

diagnosis of faults
repair of faults

Jointing and terminating

polymeric heat shrink materials
polymeric tape materials

Test procedures and commissioning

inspection
test instruments
polarity
voltage
phase sequence

Supply Authority Regulations

Overhead service arrangements and procedures

Clearance to assets and structures

power lines
communications systems
buildings

Service line constructional requirements

fuse boxes, bases and carriers
fuse ratings
fuse removal/replacement
conductors and connections
single phase/multi phase services
mid span services

Fault diagnosis and repair

Test procedures and commissioning

inspection
test instruments
polarity
voltage
phase sequence
Supply Authority Regulations

6. Assessment strategy

Assessment methods

Short answer questions (written, oral or graphic or computer based).
Suitable practical exercises which assess the skills required of each learning outcome.

Conditions of assessment

Theory room for written tests together with practical field observation.

7. Learning outcome details

Learning outcome 1

Plan and prepare for the installation and maintenance of low voltage underground service cables.

Assessment criteria

- 1.1 Obtain and analyse all relevant text in preparation for the installation and maintenance of low voltage underground service cables.
- 1.2 Identify and interpret all technical drawings required to complete the task.
- 1.3 Identify the resources required, including personnel, plant, equipment, tools and transport to ensure the task can be completed.

Learning outcome 2

Joint, terminate and maintain energised low voltage underground service cables.

Assessment criteria

- 2.1 Prepare cable and surrounds in accordance with electricity supply industry standards and procedures.
- 2.2 Joint and terminate cables in accordance with electricity supply industry standards and procedures.
- 2.3 Test cables in accordance with electricity supply industry procedures.
- 2.4 Commission low voltage service cables in accordance with electricity supply industry procedures.

Learning outcome 3

Joint, terminate and maintain de-energised low voltage underground service cables.

Assessment criteria

- 3.1 Isolate low voltage underground service cables and prove safe to work on in accordance with electricity supply industry procedures.
- 3.2 Joint and terminate de-energised low voltage underground service cables in accordance with electricity supply industry standards.
- 3.3 Test low voltage underground service cables in accordance with electricity supply industry procedures.
- 3.4 Locate and repair faults in accordance with electricity supply industry procedures.

Learning outcome 4	Identify different low voltage overhead services, list their current carrying capacity and state their application.
Assessment criteria	<p>4.1 List all conductor cross section areas and current ratings.</p> <p>4.2 Identify a variety of service conductors used and state their application.</p> <p>4.3 Terminate various service conductors into fuse boxes and pole top connection boxes.</p>
Learning outcome 5	Describe and demonstrate the construction methods for the installation of low voltage overhead services.
Assessment criteria	<p>5.1 List the minimum clearances for overhead services over various ground conditions, and structures with varying accessibility.</p> <p>5.2 Construct overhead services to Supply Authority standards.</p> <p>5.3 Determine fuse type and rating to provide appropriate protection to the installation.</p>
Learning outcome 6	Demonstrate test procedures used prior to connecting supply to customer's premises.
Assessment criteria	<p>6.1 Identify the service test procedures performed prior to and during the commissioning stage of connecting a customers service.</p> <p>6.2 Demonstrate the tests used during the commissioning of a customers low voltage service, including: - Polarity - Voltage - Phase sequence.</p> <p>6.3 State the consequences of incorrect polarity or phase sequence connections.</p>
Learning outcome 7	Diagnose faults within service installations.
Assessment criteria	<p>7.1 Describe test procedures used to determine the nature of a fault in a customers services.</p> <p>7.2 Diagnose faults within customers service installation.</p>

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for both theoretical and/or practical learning and module purpose. It is recommended that learning and assessment be facilitated in a holistic manner which may require a learning sequence other than indicated in the body of this module descriptor.

Resource requirements

Enterprise construction manuals
Relevant Australian standards
Enterprise work manuals and standing instructions
Relevant manufacturers' equipment/component manuals
Range of materials/components
Appropriate sit layout
Test equipment
Range of tools
Safety equipment

Occupational health and safety requirements

Students should be made aware of Occupational Health and Safety issues in all situations and be expected to demonstrate safe working practices at all times. Electrical safety must be emphasised.