

**1. Module details****Module name****Extra High Voltage: Bare-hand Live Line Method 2****Module duration**

It is expected that students with the appropriate entry knowledge and skills will successfully complete this module in 18 – 20 hours.

**Module code**

NUE227

**Discipline code**

0703130

**2. Module purpose**

This module is to provide techniques that underpin safe practice and effective skill in the application of barehand live line operations at voltages of 132kV and above. In particular it focuses on the replacement of an insulator on the centre phase of a transmission line.

**3. Prerequisites**

NUE225 Extra High Voltage: Bare-hand Live Line Principles.

**4. Relationship to competency standards**

This module partially addresses Unit 4.4 of the E.S.I. National Competency Standards for Overhead Line Work and Cable Jointing.

**5. Content****Tool and equipment preparation**

task assignment  
ropes  
hotsticks  
worker preparation  
determination of sound discs

**Connecting and rigging**

using rope tackles  
ladder positioning  
leakage current monitoring  
worker positioning

**Bonding on**

effective communication  
positioning of worker on ladder  
connection of suit with bonding wand

**Disc insulator string replacement**

disc shunt placement  
strain poles and hot end yoke  
disconnection technique  
string lowering  
new string raising

reconnection techniques  
hot end hardware removal

**Bonding off**

disconnection of bonding wand  
positioning and alighting

**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**

**Prepare tools and equipment for work on the centre phase insulator of a transmission line.**

**Assessment criteria**

- 1.1 Assign tasks to each team member.
- 1.2 Prepare ropes for use.
- 1.3 Prepare hotsticks for use.
- 1.4 Prepare barehand worker for live work conditions.
- 1.5 Determine the minimum number of sound discs on the intended working string.

**Learning outcome 2**

**Connect and rig equipment necessary to replace insulator.**

**Assessment criteria**

- 2.1 Use rope tackles to raise live line ladder into work position.
- 2.2 Position ladder in contact with conductor.
- 2.3 Monitor ladder leakage current.
- 2.4 Position live line ladder appropriately for barehand worker.

**Learning outcome 3**

**Assessment criteria**

**Bond on to the transmission line conductor.**

- 3.1 Use appropriate means to communicate effectively.
- 3.2 Move out onto the live line ladder with safety.
- 3.3 Move out toward the transmission line conductor along the live line ladder with safety.
- 3.4 Connect the barehand conductive suit bonding wand on to the transmission line conductor.

**Learning outcome 4**

**Assessment criteria**

**Replace a disc insulator string on the centre phase of a transmission line.**

- 4.1 Place the disc shunt onto the string in an appropriate position.
- 4.2 Connect and position strain poles and hot end yoke.
- 4.3 Disconnect hot end of disc string from transmission line yoke.
- 4.4 Assist cold end crew and ground crew to lower disc string to the ground.
- 4.5 Assist cold end crew and ground crew to raise replacement disc string up into position.
- 4.6 Assist cold end crew to position disc string between strain poles.
- 4.7 Reconnect hot end of disc shunt.
- 4.8 Reconnect hot end of disc string to the transmission line yoke.
- 4.9 Remove hot end hardware with safety.

**Learning outcome 5**

**Assessment criteria**

**Bond off from a transmission line conductor.**

- 5.1 Disconnect the barehand conductive suit bonding wand from the transmission line conductor.
- 5.2 Move back along the live line ladder toward the transmission line tower with safety.
- 5.3 Alight from the live line ladder onto the transmission line tower with safety.

**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 manuals  
Live line hotstick kit  
Live line insulator tester  
Ladder leakage monitor  
Insulating rope test set  
Insulating rope, live line rope  
Disc Insulator String  
Mock Transmission tower wing.  
Conductive boots  
Conductive socks  
Conductive gloves  
Conductive jacket with hood  
Conductive trousers  
Bonding wand  
Tinted safety glasses

**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.