

# Certificate in Electrical Power Engineering - Overhead Lines at SCQF Level 5 (2343-53)

Unit handbook



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Updated POS to 53.

ROC Added

# 1 About this document

This document contains the unit titles, accreditation numbers and content for the Certificate in Electrical Power Engineering – Overhead Lines qualification at SCQF Level 5.

The qualification, attesting to work-place competence, has been developed by City & Guilds in conjunction with power sector employers and the sector skills council Energy & Utility Skills (EU Skills), and is accredited on the Scottish Credit and Qualifications and Framework (SCQF).

The structure of the qualification is made up of the following City & Guilds unit numbers:

- Group A – Mandatory units (001-003, 036)
- Group B – Optional Skill units (037-038)
- Group C – Optional units (004, 006, 039-052)
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To achieve this qualification candidates must achieve the following Rules of Combination;

- 19 Credits from Mandatory Group A
- 8 Credits from Optional Group B
- 26 Credits form Optional Group C

All of the performance criteria must be evidenced. In the case of each Group A mandatory unit the requisite evidence is attained through completion of the relevant skill based units on a minimum of **three** separate occasions.

To support standardisation each unit has ten suggested knowledge questions and a range of acceptable answers (see the relevant questions and answers document for further details). These questions must be evidenced through either natural performance or professional discussion. In the context of the skill-based units these questions may provide evidence against the knowledge and understanding criteria, which have been lifted directly from the relevant national occupational standard. Where there are gaps, further oral questioning or observation will be required to confirm the criteria has been met. Centres may devise their own questions in place of those provided, but they must be agreed with their External Verifier.

For standardisation, and where appropriate, the performance and knowledge criteria are:

- prescribed with range, scope and evidence requirements
- qualified by company policies and procedures; legislation and regulations.

This qualification is delivered in line with the requirements of EU Skills' assessment strategy (captured in the main qualification handbook) and in the same fashion as a Scottish Vocational Qualification (SVQ).

This unit is designed to ensure that operatives working within an electrical power engineering environment apply safe working practices in accordance with company procedures and legislative requirements.

By completing this unit, you show you are competent to:

- Recognise hazards and risks
- Demonstrate understanding of a range of information sources supporting safe working practices
- Recognise the range of Personal Protective Equipment relevant to the task being completed
- Take appropriate action in the event of emergencies
- Work safely and maintain a safe working environment
- Demonstrate an understanding of lifting techniques

### Performance Criteria

To perform effectively in this unit, you need to evidence competent performance of all the criteria through completion of the mandatory and optional skill-based units over a minimum of **three** separate occasions.

#### Outcome 1: Recognise hazards and risks

- 1.1 Identify hazards and risks and take appropriate action, **all** of the following **must** be included:
- Environment
  - Use of tools and equipment
  - Materials and substances
  - Electrical working practices

#### Outcome 2: Demonstrate understanding of a range of information sources supporting safe working practices

- 2.1 Work in accordance with approved procedures, **all** of the following **must** be included:
- Operating procedures
  - Method statements
  - COSHH statements
  - Health & Safety at Work Act
- 2.2 Identify and comply with safety signs and labels
- 2.3 Work in accordance with requirements of risk assessments

#### Outcome 3: Recognise the range of Personal Protective Equipment relevant to the task being completed

- 3.1 Select appropriate Personal Protective Equipment
- 3.2 Carry out agreed pre-use checks on Personal Protective Equipment
- 3.3 Use Personal Protective Equipment in accordance with company instructions
- 3.4 Store Personal Protective Equipment in accordance with agreed procedure

#### Outcome 4: Take appropriate action in the event of emergencies

- 4.1 Identify qualified first aiders or appointed person
- 4.2 Locate first aid facilities

- 4.3 Respond in line with company procedure to emergency situations e.g. Injury to self or others, Fire
- 4.4 Report accidents, injuries, hazardous or dangerous occurrences to appropriate personnel

**Outcome 5:** Work safely and maintain a safe working environment

- 5.1 Establish and maintain appropriate access and egress routes to working locations
- 5.2 Store resources safely, **all** of the following **must** be included:
  - Tools
  - Equipment
  - Materials
- 5.3 Use resources safely and for the purpose intended, **all** of the following **must** be included:
  - Tools
  - Equipment
  - Materials
- 5.4 Dispose of hazardous substances/waste materials in accordance with approved company procedures

**Outcome 6:** Demonstrate an understanding of lifting techniques

- 6.1 Demonstrate acceptable lifting technique when carrying out lifting of loads on their own
- 6.2 Demonstrate acceptable lifting technique when carrying out lifting of load with **one** of the following:
  - Assistance of others
  - Mechanical assistance

This unit is designed to ensure that operatives working within an electrical power engineering environment apply effective and efficient working practices in accordance with company procedures.

By completing this unit, you show you are competent to:

- Apply appropriate planning processes whilst preparing to complete allocated tasks
- Maintain effective and efficient working practices whilst completing allocated tasks
- Recognise problems or areas for improvement and respond appropriately
- Create and maintain effective working relationships
- Contribute to own development programme

### Performance Criteria

To perform effectively in this unit, you need to evidence competent performance of all the criteria through completion of the mandatory and optional skill-based units over a minimum of **three** separate occasions.

**Outcome 1:** Apply appropriate planning processes whilst preparing to complete allocated tasks

- 1.1 Select appropriate resources and ensure suitability, **all** of the following **must** be included:
  - Tools
  - Equipment
  - Materials
  - PPE
- 1.2 Prepare working area
- 1.3 Obtain authorisation to carry out the work

**Outcome 2:** Maintain effective and efficient working practices whilst completing allocated tasks

- 2.1 Adhere to all approved practices whilst completing allocated tasks
- 2.2 Return information sources to designated personnel on completion of activities
- 2.3 Return resources to designated locations on completion of activities

**Outcome 3:** Recognise problems or areas for improvement and respond appropriately

- 3.1 Recognise and respond to problems **or** areas for improvement within the engineering environment and report to the appropriate person. Problems relating to **two** of the following should be evidenced:
  - Materials
  - Tools and Equipment
  - Information sources
  - People
  - Safety procedures
  - Workmanship
  - Time
  - Weather

**Outcome 4:** Create and maintain effective working relationships

- 4.1 Dress appropriately for the working activity
- 4.2 Communicate effectively with **all** of the following:
  - Colleagues
  - Line managers
  - Members of the public
- 4.3 Resolve issues/problems amicably and through appropriate channels

**Outcome 5:** Contribute to their own development programme

- 5.1 Identify personal training/development needs in relation to your work activity and discuss with appropriate personnel
- 5.2 Review and revise personal development records

## Unit 003

# Using and communicating technical information in the power sector

This unit is designed to ensure that operatives working within the electrical power engineering environment are able to (i) identify and interpret information contained in written, diagrammatic and pictorial sources, and (ii) produce and communicate this information to other parties.

By completing this unit, you show you are competent to:

- Recognise information sources
- Obtain information contained in information sources
- Record and communicate technical information

### Performance Criteria

To perform effectively in this unit, you need to evidence competent performance of all the criteria through completion of the mandatory and optional skill-based units over a minimum of **three** separate occasions.

### Outcome 1: Recognise information sources

1.1 Identify written information sources, evidence to include **three** of the following:

- Job instructions
- Test schedules
- Company information
- Material specifications
- Reference table/chart
- Planning documentation
- Operating sheets
- Process specification
- Risk assessments
- Method statements

1.2 Identify diagrammatic/pictorial information sources, evidence to include **two** of the following:

- Detailed component drawings
- General assembly drawings
- Repair drawings
- Wiring/circuit diagrams
- Installation drawings
- Approved sketches
- Illustrations
- Visual display screens
- Modification drawings
- Sub-assembly drawings
- Schematic drawings
- Fabrication drawings
- Operational diagrams
- Physical layouts



- Manufacturers manuals/drawings
- Photographic representations

**Outcome 2:** Obtain information contained in information sources

2.1 Identify required resources to complete allocated tasks from interpretation of information sources, **all** of the following **must** be included:

- Tools
- Equipment
- Materials
- PPE

2.2 Determine from information sources **four** of the following:

- Dimensions
- Installation process
- Connections to be made
- Assembly sequence
- Operations required
- Test points to be used
- Job duration

2.3 Report to the appropriate person where inconsistencies or inaccuracies in information sources are identified

**Outcome 3:** Record and communicate technical information

3.1 Complete/produce documentation to communicate information and/or to record activities completed; evidence to include **three** of the following:

- Fully detailed sketch of work/circuits required or completed
- Planning documentation
- Resource requisitions
- Data from completed testing activities
- Risk assessment
- Training records
- Reporting problems/areas for improvement

This unit is designed to ensure that operatives in the electrical power engineering environment are able to (i) communicate with customers effectively (ii) provide accurate answers and information to questions asked (iii) deal effectively with any customer concerns.

By completing this unit, you show you are competent to:

- Prepare to visit a customer's premises
- Maintain effective relations with customers

**Performance Criteria**

To perform effectively in this unit, you need to evidence competent performance of all the criteria through completion of the mandatory and optional skill-based units over a minimum of **three** separate occasions.

**Outcome 1:** Prepare to visit a customer's premises

- 1.1 Determine the purpose for visiting the customer from information given
- 1.2 Identify the correct location using relevant information
- 1.3 Identify the main objectives to be achieved from the visit
- 1.4 Prepare relevant information/documentation prior to visiting the customer. Evidence to include **three** of the following:
  - Personal company identification
  - Plans
  - Work instruction
  - Wayleave information
  - Company information
  - Customer/client information
- 1.5 Select appropriate work wear to visit customer's premises. Evidence to include **two** of the following:
  - Domestic premises
  - Industrial/commercial premises
  - Agricultural premises
  - Building site
  - Distribution/Transmission Site

**Outcome 2:** Maintain effective relations with customers

- 2.1 Introduce and identify self to customer in a polite and courteous manner
- 2.2 Accurately and effectively describe the purpose of the visit to the customer
- 2.3 Listen attentively to the customer, responding to questions asked with accurate information
- 2.4 Agree the objectives with the customer giving all relevant information
- 2.5 Record/report information of visit in an appropriate manner (where applicable)
- 2.6 Respond to customer concerns/complaints in a sympathetic and effective manner. Evidence to include **two** of the following:
  - Resolve the customers' issues on site within own level of responsibility

- Resolve the customers issues when outside of own responsibility by referring the matter to the appropriate person on site
- Report issues which cannot be resolved on site to the appropriate person/section
- Provide the customer with appropriate contact details of other personnel/sections if requested

This unit is about safe entry, egress and movement in substations in a electrical power engineering environment. It involves procedures to be followed and measures to be taken to make sure that the working environment is free from obstacles and hazards that may cause harm to self, your work colleagues and the general public.

By completing this unit, you show you are competent to:

- Plan for access and egress of a substation
- Prepare resources for accessing and egressing of a substation
- Access and egress a substation
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

#### Outcome 1: Plan for access and egress of substation

- 1.1 Identify the correct substation to be accessed using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

#### Outcome 2: Prepare resources to access and egress substation

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### Outcome 3: Carry out the access and egress of substation

- 3.1 Conduct a pre-entry inspection of the identified substation in line with the work plan, risk assessment and company procedures. To include **three** different substation locations
- 3.2 Inform all relevant parties of their presence and intended work plan
- 3.3 Conduct a visual inspection of the site and apply appropriate control measures to ensure the work area is in a safe and suitable condition for work to commence in line with risk assessment requirements and company procedures (e.g. Prevention of unauthorised access, Signs/barriers, Demarcation of routes/work areas, Control/removal of hazards)
- 3.4 Access, egress and move around the identified sub station in accordance with company procedures and safe working practices
- 3.5 Identify, record and report substation faults to the appropriate person in accordance with company procedures, where applicable
- 3.6 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:

- Proximity to live equipment
  - Unauthorised access
  - Defective equipment
  - Environmental/site conditions
- 3.7 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
  - 3.8 Confirm the completion of the work activity with relevant parties in line with company procedures
  - 3.9 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
  - 3.10 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
  - 3.11 Ensure the work area is left in a safe and tidy condition compatible with company procedures
  - 3.12 Leave the substation in a safe and secure condition in accordance with company procedures and statutory regulations

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4: General**

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The organisations reporting lines and authorisation roles and responsibilities
- 4.3 The organisations policies and procedures that directly impact on access of the location and work area

#### **Outcome 5: Work area**

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools or equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools or equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Organisations work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 Work authorisation and permits to work procedures and documentation
- 5.12 How to recognise and minimise the impact of dangers and hazards that might cause harm or injury to self and others
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation
- 5.14 What different access arrangements need to be complied within different areas

This unit is about moving overhead plant and apparatus. It involves the processes and procedures to be followed to make sure that loads are secured and moved safely using lifting methods and equipment that are fit for purpose and meet health and safety regulations.

By completing this unit, you show you are competent to:

- Plan the movement of overhead line plant and apparatus
- Prepare the movement of overhead line plant and apparatus
- Move, secure and position the load
- Use and communicate data and information
- Resolve problems effectively and efficiently

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 1:** Plan for work activities to move overhead line plant and apparatus

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the moving operation in line with the risk assessment, taking into account factors such as location, sequence of tasks, personnel and size, weight and stability of the load to be moved
- 1.4 Identify a route compatible with the risk assessment and health and safety procedures
- 1.5 Inform all affected parties of their intended work plan, in accordance with company procedures

#### **Outcome 2:** Prepare resources to move overhead line plant and apparatus

- 2.1 Identify the load to be moved, in line with work plan. To include at least **three** different types of loads (e.g. large cable drum, Transformer, Switchgear, Distribution Pole, Heavy steelwork).
- 2.2 Select, inspect and wear Personal Protective Equipment (PPE) in line with work plan, risk assessment and health and safety regulations
- 2.3 Apply appropriate control measures to ensure the work area is in a safe and suitable condition for work to commence in line with risk assessment requirements and company procedures (e.g. signs/barriers, control/removal of hazards, traffic control)
- 2.4 Establish the weight and stability of the load to be moved, in accordance with the work plan
- 2.5 Identify a lifting and moving technique, in line with company procedures, compatible with the weight and stability of the load
- 2.6 Select, inspect and prepare moving equipment capable of handling the weight and stability of the load
- 2.7 Select additional tools and equipment necessary to perform the operation
- 2.8 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### **Outcome 3:** Carry out the movement of overhead line plant and apparatus

- 3.1 Position and secure the lifting and moving equipment to the load, ensuring the weight is evenly distributed in line with safe working procedures
- 3.2 Lift and move the identified load safely and efficiently along the planned route
- 3.3 Secure the load safely in its final identified position in line with the work plan

- 3.4 Check the finished product meets the work specification and company requirements
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Positioning/securing of loads
  - Environmental/site conditions
  - Equipment/resources
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit candidates **must** also incorporate the following additional requirements in the process of moving the **three** different loads identified in the unit:

- Use safely at least **six** of the following pieces of equipment:
  - Slings
  - Shackles
  - Chain Lifts
  - Winches/Hoists
  - Rollers
  - Ratchet Straps
  - Pull Lifts
  - Tirlors
  - Ropes
  - Other Mechanical Aids
- Incorporate the use of powered lifting equipment on at least **one** occasion
- Lift plant and apparatus at height on **two** different occasions
- Move a load across **all** of the following:
  - Across a difficult route
  - Where space and positioning is confined
  - Where the load is unbalanced and/or complex

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.3 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.4 How to minimise risks to self and others when undertaking work activities

- 5.5 Read and interpret work instruction, information and reporting systems and documentation
- 5.6 How to respond to the different types and categories of emergency situations that might occur
- 5.7 Methods and procedures for securing loads in their final location
- 5.8 Methods that can be adopted to establish the weight of a load
- 5.9 The criteria to use to make sure that the method and lifting equipment chosen to move a load is fit for purpose
- 5.10 How to recognise and report inaccurate and incorrect work instructions and documentation



## Unit 037

# Access/egress and work on wood pole structures

This unit is about safe entry, egress and working on wood pole structures in an electrical power engineering environment. It involves procedures to be followed and measures to be taken to make sure that the working environment is free from obstacles and hazards that may cause harm to self, your work colleagues and the general public.

By completing this unit, you show you are competent to:

- Plan to access / egress and work in positions at height on wood pole structures
- Prepare to access / egress and work in positions at height on wood pole structures
- Access / egress and work in positions at height on wood pole structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to access/egress and work in positions at height on wood pole structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks, personnel and method of access and egress
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

**Outcome 2:** Prepare resources to access/egress and work in positions at height on wood pole structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure to be worked on and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, rescue equipment available, identification of isolation/earthing points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out access and egress operations and work in positions at height on wood pole structures

- 3.1 Use the identified access and egress equipment in a safe and efficient manner in accordance with company procedures and statutory regulations. Evidence to include the use of **two**

- different attached climbing techniques used on separate occasions (e.g. pole choker, fall arrest lanyard, rope and slide chuck)
- 3.2 Conduct all work and movement on the structure in an approved manner complying with all relevant health and safety procedures
  - 3.3 Raise, lower and use all tools and equipment safely and efficiently in accordance with company procedures
  - 3.4 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
    - Equipment use
    - Environmental/site conditions
    - Structure condition
    - Effects of other people
  - 3.5 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
  - 3.6 Confirm the completion of the work activity with relevant parties in line with company procedures
  - 3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
  - 3.8 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
  - 3.9 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit candidates **must** also:

- Establish and use safely a Mobile Elevated Work Platform to access and egress equipment on **one** occasion
- Install a set of overhead line earthing electrodes in the ground and apply earthing connectors to overhead line conductors in accordance with company procedures on **one** occasion
- Safely establish and use a double extension ladder to access/egress a work position on **one** occasion

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The organisations reporting lines and authorisation roles and responsibilities
- 4.3 The organisations policies and procedures that directly impact on access of the location and work area

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools or equipment are fit for purpose and safe to use
- 5.3 Identify what processes and procedures need to be followed and complied with when inspecting and preparing tools or equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 Identify what Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 Identify what materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Organisations work instruction, information and reporting systems and documentation

- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 Work authorisation and permits to work procedures and documentation
- 5.12 How to recognise and minimise the impact of dangers and hazards that might cause harm or injury to self and others
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation
- 5.14 Know what the different access arrangements that need to be complied with in different areas are

## Unit 038

# Access/egress and work on steel tower structures

This unit is about safe entry, egress and working on steel tower structures in an electrical power engineering environment. It involves procedures to be followed and measures to be taken to make sure that the working environment is free from obstacles and hazards that may cause harm to self, your work colleagues and the general public.

By completing this unit, you show you are competent to:

- Plan to access / egress and work in positions at height on steel tower structures
- Prepare to access / egress and work in positions at height on steel tower structures
- Access / egress and work in positions at height on steel tower structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to access/egress and work in positions of height on steel tower structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks, personnel and method of access and egress
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

**Outcome 2:** Prepare resources to access/egress and work in positions of height on steel tower structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure to be worked on, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out work and the access/egress in positions of height on steel tower structures

- 3.1 Use the identified access and egress equipment in a safe and efficient manner in accordance with company procedures and statutory regulations. Evidence to include the use of **two** different attached climbing techniques to access and egress steel tower structures on separate occasions
- 3.2 Conduct all work and movement on the structure in an approved manner complying with all relevant health and safety procedures
- 3.3 Raise, lower and use all tools and equipment safely and efficiently in accordance with company procedures
- 3.4 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Equipment use
  - Environmental conditions
  - Structure condition
  - Effects of other people
- 3.5 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.6 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.8 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.9 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional requirements**

To complete this unit candidates **must** also safely establish and use in accordance with company procedures **two** of the following pieces of equipment on at least **one** occasion:

- Tower ladder
- Conductor trolley
- Tower platform
- Jumper basket
- Mobile elevated work platform

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The organisations reporting lines and authorisation roles and responsibilities
- 4.3 The organisations policies and procedures that directly impact on access of the location and work area

**Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools or equipment are fit for purpose and safe to use
- 5.3 Identify what processes and procedures need to be followed and complied with when inspecting and preparing tools or equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 Identify what Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 Identify what materials and substances are dangerous and hazardous to health

- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Organisations work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 Work authorisation and permits to work procedures and documentation
- 5.12 How to recognise and minimise the impact of dangers and hazards that might cause harm or injury to self and others
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation
- 5.14 Know what the different access arrangements that need to be complied with in different areas are

## Unit 039

# Install overhead steelwork, fittings and conductors on wood pole structures

This unit is about installing overhead steelworks, fittings and conductors on wood pole structures in an electrical power engineering environment. It involves completing installation activities in a rigorous and methodical manner and the following of processes and procedures to make sure that the finishes work meets the quality assurance and operating specifications set by the organisation.

By completing this unit you show you are competent to:

- Plan to install steelworks, fittings and conductors on wood pole structures
- Prepare to install steelworks, fittings and conductors on wood pole structures
- Install steelworks, fittings and conductors on wood pole structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to install overhead steelwork, fittings and conductors on wood pole structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with risk the assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

**Outcome 2:** Prepare resources to install overhead steelwork, fittings and conductors on wood pole structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure to be worked on and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, rescue equipment available, identification of isolation/earthing points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the installation overhead steelwork, fittings and conductors on wood pole structures

- 3.1 Install all steelwork and fittings safely and effectively in line with company procedures on **all** of the following:

- Intermediate pole
  - Angle pole
  - Section pole
  - Terminal pole
- 3.2 Fit and secure conductors to insulators safely and effectively in line with company procedures on **all** of the following:
- Intermediate pole
  - Angle pole
  - Section pole
  - Terminal pole
- 3.3 Check the finished product meets company standards and is compliant with required specifications
- 3.4 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
- Equipment use
  - Environmental conditions
  - Material condition
  - Resources
  - Effects of other people
- 3.5 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.6 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.8 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.9 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional requirements**

To complete this unit you **must** also:

- Carry out the tensioning and termination of conductors on **two** occasions
- Install tension joints to connect conductors on **two** occasions
- Install non-tension joints to connect conductors on **two** occasions

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 Know what Personal Protective Equipment needs to worn when undertaken work activities



- 5.6 Know what materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to install plant and apparatus using specified principles, methods, processes and procedures
- 5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about dismantling overhead steelworks, fittings and conductors on wood pole structures in an electrical power engineering environment. It involves the rigorous and methodical following of processes and procedures to make sure that the completed work meets the quality assurance and operating specifications set by the organisation. It also involves using a range of tools and equipment and the wearing of Personal Protective Equipment whilst carrying out the work.

By completing this unit, you show you are competent to:

- Plan to dismantle steelworks, fittings and conductors on wood pole structures
- Prepare to dismantle steelworks, fittings and conductors on wood pole structures
- Dismantle steelworks, fittings and conductors on wood pole structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

**Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to dismantle overhead steelwork, fittings and conductors on wood pole structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to dismantle overhead steelwork, fittings and conductors on wood pole structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure to be worked on and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, rescue equipment available, identification of isolation/earthing points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the dismantlement of overhead steelwork, fittings and conductors on wood pole structures

- 3.1 De-tension and lower conductors safely and effectively ensuring any stored energy is released in a controlled manner on **two** different wood pole constructions
- 3.2 Dismantle and remove all identified steelwork and fittings safely and effectively in line with the work plan, risk assessment and company procedures on **two** different wood pole constructions
- 3.3 Check the finished product is compliant with the required work specification
- 3.4 Identify and store safely re-usable plant, apparatus and components in a designated area
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Equipment use
  - Environmental conditions
  - Material condition
  - Resources
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

**Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to dismantle plant and apparatus using specified assemble principles, methods, processes and procedures
- 5.12 What handling techniques and equipment to adopt and use when dismantling plant and apparatus
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation

## Unit 041

# Install and configure distribution apparatus on wood pole structures

This unit is about installing and configuring distribution apparatus on wood pole structures in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the plant and apparatus to be configured meets the quality assurance and operating specifications set by the organisation.

By completing this unit, you show you are competent to:

- Plan to install and configure distribution apparatus at height on wood pole structures
- Prepare to install and configure distribution apparatus at height on wood pole structures
- Install and configure distribution apparatus at height on wood pole structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to install and configure overhead line apparatus at height on wood pole structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to install and configure overhead line apparatus at height on wood pole structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure to be worked on, including points of isolation and earthing arrangements
- 2.6 Carry out a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.7 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, rescue equipment available)
- 2.8 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the installation and configure overhead line apparatus at height on wood pole structures

- 3.1 Perform the installation and securing of the plant and apparatus in accordance with work plan, risk assessment and company procedures on **three** different types of plant e.g. ABSD, Auto recloser, HV fuses, Cable termination, Sectionaliser.
- 3.2 Carry out the connection of the plant in accordance with company procedures and specifications
- 3.3 Check the finished product is compliant with maintenance specifications and work instruction requirements
- 3.4 Perform testing procedures in line with company procedures to ensure the completed installation meets company requirements, where applicable
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Plant/apparatus
  - Environmental conditions
  - Structure condition
  - Effects of other people
  - Electrical connections
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit you **must** also carry out the wiring of a three phase pole mounted transformer on at least **one** occasion.

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

**Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 Read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.4 How to maintain safe working and environmental practices throughout the duration of the work
- 5.5 How to minimise risks to self and others when undertaking work activities
- 5.6 Company work instruction, information and reporting systems and documentation
- 5.7 How to respond to the different types and categories of emergency situations that might occur
- 5.8 How to read, interpret and apply prescribed 'setting-up' documentation and procedures for configuring equipment
- 5.9 Recognise and report inaccurate and incorrect work instructions and documentation

## Unit 042

# Excavate and install distribution wood poles and stays

This unit is about excavating and installing distribution wood poles and stays in an electrical power engineering environment. It includes the procedures to be followed and the measures to be taken to make sure that self, work colleagues and the general public are protected from harm when in the vicinity of the excavation. It also involves using a range of tools and equipment and the wearing of Personal Protective Equipment whilst carrying out the work.

By completing this unit, you show you are competent to:

- Plan to excavate and install distribution wood poles and stays
- Prepare to excavate and install distribution wood poles and stays
- Excavate and install distribution wood poles and stays
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to excavate and install distribution wood poles and stays

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with risk the assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

**Outcome 2:** Prepare resources to excavate and install distribution wood poles and stays

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures
- 2.5 Use cable avoidance and safe excavation techniques in accordance with company procedures prior to excavation to identify potential hazards

**Outcome 3:** Carry out the excavation and installation of distribution wood poles and stays

- 3.1 Carry out excavation activities using safe excavation techniques in line with work plan, risk assessment and company procedures
- 3.2 Ensure the finished excavation is suitable and sufficient for its intended use in line with company specifications
- 3.3 Carry out the installation of **two** distribution poles and **two** complete stay arrangements in compliance with company specifications and statutory requirements
- 3.4 Ensure the apparatus is installed in a safe, efficient manner in compliance with company specifications and procedures

- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Pole/stay positioning
  - Environmental conditions
  - Site conditions
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit you **must** also give instruction and monitor the use of mechanised equipment to complete a pole or stay excavation on at least **one** occasion.

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.4 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.5 What materials and substances are dangerous and hazardous to health
- 5.6 How to maintain safe working and environmental practices throughout the duration of the work
- 5.7 How to minimise risks to self and others when undertaking work activities
- 5.8 Company work instruction, information and reporting systems and documentation
- 5.9 How to respond to the different types and categories of emergency situations that might occur
- 5.10 Recognise and report inaccurate and incorrect work instructions and documentation
- 5.11 What are the different control measure that can be used to protect the safety of self and others
- 5.12 What type of control measures should be chosen and applied for a given purpose

## Unit 043

# Electrical testing of overhead line distribution equipment

This unit is about electrical testing of overhead line distribution equipment in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that tests are conducted and recorded in a manner that meets the quality assurance requirements and standards set by the organisation.

By completing this unit you show you are competent to:

- Plan to test overhead line equipment electrically
- Prepare to test overhead line equipment electrically
- Test overhead line equipment electrically
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

#### Outcome 1: Plan for work activities to test overhead line equipment electrically

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in accordance with company procedures

#### Outcome 2: Prepare resources to test overhead line equipment electrically

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the work position and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, shrouding, rescue equipment available, identification of circuit isolation points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### Outcome 3: Carry out the electrical testing of overhead line equipment

- 3.1 Select, inspect and use the appropriate PPE and testing equipment in line with, work plan, risk assessment and company procedures in **both** of the following situations:
  - Electrical testing of low voltage overhead lines (wood pole at height)
  - Electrical testing of low voltage service/mains positions (ground position)



- 3.2 Perform at least **four** of the following low voltage tests:
  - Polarity
  - Insulation resistance
  - Earth loop impedance
  - Three phase testing
  - Phase rotation
  - Voltage testing
  - Continuity testing
- 3.3 Confirm and correctly interpret the results of the testing operations
- 3.4 Record the results of the testing in line with company procedures, where applicable
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Earth electrode readings
  - Earth loop impedance reading
  - Voltage fluctuation
  - Phase rotation or polarity
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit you **must** also perform earth electrode testing on **one** of the following earthing systems:

- Sub-station
- Cable
- Auto Recloser

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.4 How to maintain safe working and environmental practices throughout the duration of the work
- 5.5 How to minimise risks to self and others when undertaking work activities
- 5.6 Company work instruction, information and reporting systems and documentation
- 5.7 How to respond to the different types and categories of emergency situations that might occur

- 5.8 How to apply test principles, methods, processes and procedures on plant and apparatus
- 5.9 How to interpret test results and report findings
- 5.10 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about repairing faults of overhead line distribution assets in an electrical power engineering environment. It involves following routine fault rectification and repair procedures. It also involve inspecting the finished repair and rectification work to make sure it's operates in a manner that meets operating specifications and quality standards and criteria set by the organisation.

By completing this unit, you show you are competent to:

- Plan to repair faults of overhead line assets at height
- Prepare to repair faults of overhead line assets at height
- Repair faults of overhead line assets at height
- Use and communicate data and information
- Resolve problems effectively and efficiently

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to repair faults overhead line assets at height

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to repair faults overhead line assets at height

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure to be worked on and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, rescue equipment available, lighting, traffic control and identification of circuit isolation points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the repair faults overhead line assets at height

- 3.1 Carry out fault repair, safely and efficiently on identified asset in line with work plan, risk assessment and company procedures on **three** of the following:
  - HV conductors
  - HV apparatus
  - LV mains conductors

- LV apparatus
  - LV service conductors
  - LV service apparatus
- 3.2 Check finished product meets company specifications, using relevant testing procedures to confirm correct operation of equipment where applicable
  - 3.3 Report and record the repair in accordance with company procedures
  - 3.4 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
    - Plant/apparatus
    - Environmental conditions
    - Structure condition
    - Safety or earthing/bonding arrangements
    - Effects of other people
  - 3.5 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
  - 3.6 Confirm the completion of the work activity with relevant parties in line with company procedures
  - 3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
  - 3.8 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
  - 3.9 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to read, interpret and follow fault repair work instructions, processes and procedures
- 5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about live low voltage operations in an electrical power engineering environment. It involves inspecting the completed work to make sure it meets quality assurance and operating requirements. It also involves the following of procedures to ensure that safe working practices are adopted throughout the duration of the work.

By completing this unit, you show you are competent to:

- Plan for work on live low voltage equipment at height
- Prepare resources for work on live low voltage equipment at height
- Perform work on live low voltage equipment at height
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to work on live low voltage equipment at height

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to work on live low voltage equipment at height

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.3 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.4 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.5 Identify the structure and apparatus to be worked on and carry out a pre work inspection, reporting identified defects in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. Identification of circuit isolation points, person in attendance when working at height, control/removal of hazards, shrouding, rescue equipment available, identification of circuit isolation points)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Work on live low voltage equipment at height

- 3.1 Perform live work safely and efficiently in line with work plan, risk assessment and company procedures on **two** of the following LV configurations:
  - Aerial bundled mains network
  - Open wire mains network

- Service connections
  - Under eaves wiring
- 3.2 Check the finished product meets company specifications, using relevant testing procedures to confirm correct operation of equipment where applicable
  - 3.3 Report and record the repair in accordance with company procedures where applicable
  - 3.4 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
    - Environmental conditions
    - Structure condition
    - Phase rotation or polarity
    - Voltage/current loading
    - Effects of other people
  - 3.5 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
  - 3.6 Confirm the completion of the work activity with relevant parties in line with company procedures
  - 3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
  - 3.8 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
  - 3.9 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.3 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.4 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.5 What materials and substances are dangerous and hazardous to health
- 5.6 How to maintain safe working and environmental practices throughout the duration of the work
- 5.7 How to minimise risks to self and others when undertaking work activities
- 5.8 Company work instruction, information and reporting systems and documentation
- 5.9 How to respond to the different types and categories of emergency situations that might occur
- 5.10 How to read, interpret and complete authorisation procedures and documentation
- 5.11 Recognise and report inaccurate and incorrect work instructions and documentation
- 5.12 Electrical and mechanical inspection and testing principles, methods, processes and procedures
- 5.13 Live line working practices and procedures and safety rules and regulations

This unit is about performing inspection work of overhead line wood pole networks in an electrical power engineering environment. It includes the processes and procedures that need to be rigorously and methodically followed to make sure that the finished work meets the quality assurance and operating specifications set by the organisation. It also involves using a range of tools and equipment that are fit for purpose and the wearing of Personal Protective Equipment when performing work activities.

By completing this unit, you show you are competent to:

- Plan to inspect an overhead line network
- Prepare to an overhead line network
- Inspect an overhead line network
- Use and communicate data and information
- Resolve problems effectively and efficiently

**Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to inspect an overhead line network

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as inspection route, lone working arrangements, locations, content and sequence of tasks
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to inspect an overhead line network

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct network to be inspected, in line with company procedures and work plan
- 2.3 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.5 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the inspection of an overhead line network

- 3.1 Perform inspection of an overhead line network on **two** different occasions in line with work plan, risk assessment and company procedures
- 3.2 Perform relevant pole testing procedures on **three** different wood pole structures. Evidence to include **three** of the following:
  - Hammer test
  - Prod test
  - Auger sample
  - Visual inspection

- 3.3 Identify **two** different examples of network conditions which do not meet the company specifications. For example – leaning or damaged pole, damaged conductor, faulty insulators, incorrect stay arrangement, incorrect conductor clearance, missing safety equipment, etc.
- 3.4 Record and report the inspection in accordance with company procedures
- 3.5 Record and report necessary test results in accordance with company procedures
- 3.6 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Hazardous conditions
  - Faulty equipment
  - Faulty network issues
  - Access to site
  - Wayleave issues
- 3.7 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.8 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.9 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.10 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.11 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 Read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 What inspection processes and equipment to use for a specific and given purpose
- 5.12 How read and analyse inspection data, interpret and record findings
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation



## Unit 047

# Earthing of overhead line conductors on steel tower structures

This unit is about earthing overhead line conductors on steel tower networks in an electrical power engineering environment. It involves using tools and equipment in a safe, methodical and vigilant manner to make sure the earthing of plant and apparatus is conducted safely and in accordance with health and safety rules and regulations.

By completing this unit you show you are competent to:

- Plan to earth overhead line transmission conductors
- Prepare to earth overhead line transmission conductors
- Earth overhead line transmission conductors
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

#### Outcome 1: Plan for work activities to earth overhead line transmission conductors

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

#### Outcome 2: Prepare resources to earth overhead line transmission conductors

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure and circuit to be earthed, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### Outcome 3: Carry out the earthing of overhead line transmission conductors

- 3.1 Ensure resources are raised, lowered and used safely in accordance with company procedures

- 3.2 Apply earthing connectors in the correct sequence in accordance with company procedures on **two** different earthing schemes
- 3.3 Check the finished earthing installation meets with the work requirements
- 3.4 Record and report the relevant earthing information in accordance with company requirements
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Safety or earthing/bonding arrangements
  - Environmental conditions
  - Structure condition
  - Earthing/bonding equipment
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 What handling techniques and equipment to adopt and use when earthing plant and apparatus
- 5.12 Know what the tools, techniques and processes to use when earthing plant and apparatus
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about installing and replacing fittings on steel tower structures in an electrical power engineering environment. It involves completing installation activities in a rigorous and methodical manner and the following of processes and procedures to make sure that the finished work meets the quality assurance and operating specifications set by the organisation.

By completing this unit you show you are competent to:

- Plan to install/replace fittings on steel tower structures
- Prepare to install/replace fittings on steel tower structures
- Install/replace fittings on steel tower structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 1:** Plan for work activities to install/replace fittings on steel tower structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

#### **Outcome 2:** Prepare resources to install/replace fittings on steel tower structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure and circuit to be worked on, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### **Outcome 3:** Carry out the installation/replacement of fittings on steel tower structures

- 3.1 Ensure resources are raised, lowered and used safely in accordance with company procedures
- 3.2 Install and replace fittings in line with work plan, risk assessment and company procedures on **three** different steel tower structures

- 3.3 Install and replace a minimum of **four** of the following:
- Vibration dampers
  - Conductor spacers
  - Tension insulators
  - Suspension insulators
  - Tower furniture
  - Anti climbing devices
  - Suspension/tension fittings
  - Tower steelwork
  - Earth wire fitting
- 3.4 Check the finished product for compliance with job requirements, referring to specifications where applicable
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
- Equipment use
  - Environmental conditions
  - Material condition
  - Resources
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur

- 5.11 How to install plant and apparatus using specified principles, methods, processes and procedures
- 5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about installing EHV conductors on steel tower structures in an electrical power engineering environment. It involves completing installation activities in a rigorous and methodical manner and the following of processes and procedures to make sure that the finished work meets the quality assurance and operating specifications set by the organisation.

By completing this unit you show you are competent to:

- Plan to install transmission conductors on steel tower structures
- Prepare to install transmission conductors on steel tower structures
- Install transmission conductors on steel tower structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 1:** Plan for work activities to install transmission conductors on steel tower structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

#### **Outcome 2:** Prepare resources to install transmission conductors on steel tower structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure and circuit to be worked on, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### **Outcome 3:** Carry out the installation of transmission conductors on steel tower structures

- 3.1 Ensure resources are raised, lowered and used safely in accordance with company procedures

- 3.2 Install and secure conductors to suspension insulators safely and effectively in line with work plan, risk assessment and company procedures and specification documents on **two** different occasions
- 3.3 Carry out the tensioning and termination of conductors in line with company procedures and specification documents on **two** different occasions
- 3.4 Check the finished product for compliance with job requirements, referring to specifications where applicable.
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Equipment use
  - Environmental conditions
  - Material condition
  - Resources
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 Processes and procedures to be followed for inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to install plant and apparatus using specified principles, methods, processes and procedures
- 5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about installing EHV conductors on steel tower structures in an electrical power engineering environment. It involves the rigorous and methodical following of processes and procedures to make sure that the completed work meets the quality assurance and operating specifications set by the organisation. It also involves using a range of tools and equipment and the wearing of Personal Protective Equipment whilst carrying out the work.

By completing this unit, you show you are competent to:

- Plan to dismantle transmission conductors on steel tower structures
- Prepare to dismantle transmission conductors on steel tower structures
- Dismantle transmission conductors on steel tower structures
- Use and communicate data and information
- Resolve problems effectively and efficiently

**Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to dismantle transmission conductors on steel tower structures

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to dismantle transmission conductors on steel tower structures

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure and circuit to be worked on, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures



**Outcome 3:** Carry out the dismantlement of transmission conductors on steel tower structures

- 3.1 Ensure resources are raised, lowered and used safely in accordance with company procedures
- 3.2 Disconnect and reconnect conductors in accordance with company procedures
- 3.3 Dismantle, remove and lower conductors from suspension insulators safely and effectively in line with company procedures on **two** different occasions ensuring any stored energy is released in a controlled manner
- 3.4 Dismantle and de-tension conductors from tension insulators safely and effectively in line with company procedures on **two** different occasions ensuring any stored energy is released in a controlled manner
- 3.5 Check the finished product for compliance with job requirements, referring to specifications where applicable
- 3.6 Identify and store safely re-usable plant, apparatus and components in a designated area
- 3.7 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Equipment use
  - Environmental conditions
  - Material condition
  - Resources
  - Effects of other people
- 3.8 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.9 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.10 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.11 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.12 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

**Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health
- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to dismantle plant and apparatus using specified assemble principles, methods, processes and procedures

- 5.12 What handling techniques and equipment to adopt and use when dismantling plant and apparatus
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about maintaining apparatus on steel tower structures in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed maintenance work meets the quality assurance and operating specifications set by the organisation. It includes aspects of communication and the safe working practices that need to be followed in the workplace.

By completing this unit, you show you are competent to:

- Plan to maintain overhead line transmission apparatus
- Prepare to maintain overhead line transmission apparatus
- Maintain overhead line transmission apparatus
- Use and communicate data and information
- Resolve problems effectively and efficiently

**Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 1:** Plan for work activities to maintain overhead line transmission apparatus

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

**Outcome 2:** Prepare resources to maintain overhead line transmission apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct structure and circuit to be worked on, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company procedures
- 2.6 Select, inspect and prepare suitable access and egress equipment to carry out the identified work in accordance with company procedures
- 2.7 Perform a pre work inspection of the structure and apparatus to be worked on, reporting identified defects in line with company procedures
- 2.8 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.9 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

**Outcome 3:** Carry out the maintenance of overhead line transmission apparatus

- 3.1 Ensure resources are raised, lowered and used safely in accordance with company procedures
- 3.2 Perform the maintenance operations in accordance with work plan, risk assessment and company procedures on **four** of the following different types of apparatus:
  - Earth wire fittings
  - Access/egress fittings
  - Tower furniture
  - Tension fittings
  - Suspension fittings
  - Anti climbing devices
  - Conductor fitting
  - Conductor
  - Tower steelwork
  - Tower foundations
- 3.3 Check the finished product for compliance with company standards, referring to the specification where applicable
- 3.4 Report and record the repair in accordance with company procedures where applicable
- 3.5 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Apparatus/materials
  - Structure condition
  - Safety arrangements
  - Environmental/site conditions
  - Effects of other people
- 3.6 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.7 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.8 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.9 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.10 Ensure the work area is left in a safe and tidy condition compatible with company procedures

**Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

**Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

**Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when inspecting and preparing tools and equipment prior to use
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 What materials and substances are dangerous and hazardous to health

- 5.7 How to maintain safe working and environmental practices throughout the duration of the work
- 5.8 How to minimise risks to self and others when undertaking work activities
- 5.9 Company work instruction, information and reporting systems and documentation
- 5.10 How to respond to the different types and categories of emergency situations that might occur
- 5.11 How to maintain plant and apparatus using specified assemble principles, methods, processes and procedures
- 5.12 What handling techniques and equipment to adopt and use when maintaining plant and apparatus
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation

This unit is about performing jointing of overhead line EHV conductors in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed work meets the quality assurance and operating specifications set by the organisation. It also involves following and complying with health and safety measures to minimise the risk of harm and injury to self and others when undertaking and completing jointing work activities.

By completing this unit, you show you are competent to:

- Plan for jointing of overhead line transmission conductors
- Prepare for jointing of overhead line transmission conductors
- Perform jointing of overhead line transmission conductors
- Use and communicate data and information
- Resolve problems effectively and efficiently

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas.

#### Outcome 1: Plan for work activities to joint overhead line transmission conductors

- 1.1 Identify the correct work location using available information
- 1.2 Conduct a site specific risk assessment, completing required documentation, in line with health and safety regulations
- 1.3 Plan the work to be undertaken to comply with company procedures in line with the risk assessment, taking into account factors such as location, content, sequence of tasks and personnel
- 1.4 Inform all affected parties of their intended work plan, in line with company procedures

#### Outcome 2: Prepare resources to joint overhead line transmission conductors

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations
- 2.2 Identify the correct conductors to be jointed, in line with company procedures and work plan
- 2.3 Confirm the system is safe to work on in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.6 Apply appropriate control measures in line with risk assessment requirements and company procedures (e.g. person in attendance when working at height, control/removal of hazards, pennants/flags, rescue equipment available)
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

#### Outcome 3: Carry out the jointing of overhead line transmission conductors

- 3.1 Prepare and joint **two** tension joints (e.g. midspan/tension-anchor joint (gun end), in line with company procedures and manufacturers specifications
- 3.2 Prepare and joint **two** non-tension joints, in line with company procedures and manufacturers specifications
- 3.3 Check the finished product for compliance with the relevant specification in line with company procedures

- 3.4 Perform testing procedures in line with company procedures to ensure the completed joint meets company specifications, where applicable
- 3.5 Record the results of the testing in accordance with company procedures where applicable
- 3.6 Deal with all problems encountered safely and efficiently, referring matters which cannot be rectified to the appropriate person; evidence to include **one** of the following problems:
  - Jointing equipment or conductor
  - Environmental conditions
  - Safety issues
  - Earthing arrangements
  - Effects of others
- 3.7 Work throughout the duration of the work in accordance with safe working and environmental practices, company procedures, health and safety regulations and environmental legislation
- 3.8 Confirm the completion of the work activity with relevant parties in line with company procedures
- 3.9 Ensure all tools and equipment are stored safely and appropriately in line with company procedures
- 3.10 Ensure hazardous/non hazardous waste materials are dealt with and disposed of in accordance with company and statutory procedures
- 3.11 Ensure the work area is left in a safe and tidy condition compatible with company procedures

### **Additional Requirements**

To complete this unit candidate's **must** have prepared and jointed **BOTH** Aluminium Conductor Steel Reinforced (ACSR) and All Aluminium Alloy Conductors (AAAC).

### **Knowledge and understanding**

To perform effectively in this unit, you need to have evidence in the following areas.

#### **Outcome 4:** General

- 4.1 The main principles of health and safety and environmental legislation and regulations
- 4.2 The company reporting lines and authorisation roles and responsibilities
- 4.3 The company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Work area

- 5.1 The company procedures and processes for reporting problems with tools and equipment
- 5.2 How to read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use
- 5.3 What processes and procedures need to be followed and complied with when performing switching operations
- 5.4 Read and interpret instructions on how to use tools and equipment safely and the processes and requirements for undertaking routine checks
- 5.5 What Personal Protective Equipment needs to worn when undertaken work activities
- 5.6 How to maintain safe working and environmental practices throughout the duration of the work
- 5.7 How to minimise risks to self and others when undertaking work activities
- 5.8 Company work instruction, information and reporting systems and documentation
- 5.9 How to respond to the different types and categories of emergency situations that might occur
- 5.10 What are the sequence of processes and techniques that need to be followed and applied when performing jointing activities
- 5.11 Recognise and report inaccurate and incorrect work instructions and documentation

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