Level 6 Diploma in Electrical Power Engineering - Underground Cables (2343-32)

www.cityandguilds.com
July 2011
Version 1.1

Unit handbook

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Contents

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1 About this document

This document contains the unit titles, accreditation numbers and content for the Level 6 Diploma in Electrical Power Engineering – Underground Cables qualification.

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 Framework (SCQF).

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

- Group A mandatory core units (053, 054, 055)
- Group B optional skill-based units (056, 064, 065, 066, 067, 068)

To achieve the full qualification **all** group A mandatory core units must be completed, along with a minimum of **two** group B optional skill-based units.

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

Each unit in the qualification is delivered with ten knowledge questions and their range of acceptable answers (see this qualification's 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.

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).

Unit 053 Organise the use of resources

This unit has been designed to ensure level three candidates in an electrical power engineering environment are able to plan, organise and control resources for self and others.

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

- plan the use of resources
- organise resources to be used
- control the use of resources.

Performance Criteria

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

Outcome 1: Plan the use of resources

1.1 Identify the work to be undertaken and the resources required to complete the activity to company standards

1.2 Create a plan of action to use the identified resources in a safe, time efficient and cost effective manner in line with company procedures

1.3 Identify all parties who will be affected by the planned work and the actions required to meet their requirements in line with company procedures (e.g. notification of system outage, provision of generator, access permission, traffic control, signs and barriers)

Outcome 2: Organise resources to be the used

2.1 Organise the availability of the resources for the work required using company procedures and systems. Evidence to include having organised **all** of the following resources at least **once** over a minimum of **two** separate occasions (e.g. two resources on one occasion and two on another):

- People
- Materials
- Plant/machinery
- Tools/equipment

2.2 Confirm the organised resources are available and ready for use at the correct location at the time required

Outcome 3: Control the use of resources

3.1 Inform all affected parties of the work to be undertaken and their responsibilities in line with company procedures

3.2 Co-ordinate the use of resources ensuring they are used in accordance with company policy and procedures

3.3 Monitor the effective use of the resources, taking prompt action where necessary to improve or rectify situations safely and efficiently

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:

- Resource availability
- Change in work plan
- Safety issuesd
- Time constraints

3.5 Report/record completion of the work carried out in accordance with company procedures

Unit 054 Control of working parties

This unit has been designed to ensure that level three candidates in an electrical power engineering environment are able to plan, organize and control the working activities of self and others.

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

- plan and organise working parties
- control the working party.

Performance Criteria

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

Outcome 1: Plan working party control

1.1 Correctly identify the work location using relevant information

1.2 Conduct a pre work site risk assessment completing relevant documentation in accordance with health and safety requirements and company procedures

1.3 Identify the work to be undertaken and the individuals forming the working party or parties under their control

1.4 Identify a work plan to use the work force in a safe, time efficient and cost effective manner; in line with company procedures. Evidence to include **all** of the following documents:

- Safety documentation
- Risk assessments
- Work instructions
- Plans/diagrams

Outcome 2: Organise the working party

2.1 Communicate the work plan clearly and effectively to all relevant persons under their control

2.2 Inform all relevant parties of the safety requirements and their responsibilities in line with the risk assessment and company procedures

2.3 Confirm the information given has been understood and provide clarification where needed

Outcome 3: Control the working party

3.1 Co-ordinate the working party ensuring safe working practices are maintained throughout the duration of the work in accordance with company procedures. Evidence to include the co-ordination of a working party of **two** or **more** people on **two** separate occasions (e.g. A working party of **two** may consist of you and one other person)

3.2 Monitor the effectiveness of the work plan, taking prompt action where necessary to improve or rectify situations safely and effectively

3.3 Obtain information from the working party to confirm the intended objectives have been achieved

3.4 Confirm all members of the working party have ceased work and that all tools and equipment have been accounted for before considering the work as complete

3.5 Inform all members of the working party thatthe work activity is complete and that no further work must take place

3.6 Report/record the work in accordance with company procedures

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:

- Change in work plans
- Third parties
- Safety issues
- Control of work party

Unit 055 Produce, communicate and record technical information

This unit has been designed to ensure that level three candidates in an electrical power engineering environment are able to produce written and diagrammatic technical information; communicate information to other parties; complete records relating to completed activities and performance.

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

- produce relevant information to allow self and others to complete work activities
- communicate technical information to others to carry out work activities
- record and report technical information on work activities completed by self and others.

Performance Criteria

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

Outcome 1: Produce relevant information to allow self and others to carry out work activities

1.1 Produce written/electronic text information to allow work activities to be carried out.
Evidence to include **three** of the following:

- Risk assessments
- Method statements
- Planning documentation
- Resource ordering documentation
- Safety documentation
- Reference table/chart
- Job instructions
- Test schedules

1.2 Produce diagrammatic/pictorial information to allow work activities to be carried out.
Evidence to include **three** of the following:

- Site plans/sketches
- Installation drawings
- Modification drawings
- Repair drawings
- Connection/disconnection drawings
- Wiring/circuit diagrams
- Photographic information

Outcome 2: Communicate technical information to others to carry out work activities

2.1 Communicate technical information to others clearly and effectively. Evidence to include communication for **all** of the following:

- Verbal to one person
- Verbal to more than one person
- Written/electronic text
- Diagrammatic/pictorial

2.2 Confirm that information has been understood and provide clarification where requested

Outcome 3: Record/report technical information on work activities completed by self and others

3.1 Complete documentation to record work activities completed by self and others; evidence to include **three** of the following:

- Work instructions
- Safety documentation
- Updated plans/drawings
- Completed testing activities
- Reports
- Work schedules

3.2 Store/record all completed documentation in accordance with company procedures

3.3 Report any inconsistencies or inaccuracies in information sources to the appropriate person in line with company procedures

Unit 056 Low voltage sub-station switching operations

This unit is about switching operations in low voltage substations in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed switching operation meets the standards set by the organization. It also involves the rigorous application of rules, regulations and work instructions to ensure that work is performed and completed safely without causing risk of injury to self and others.

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

- Plan for low voltage switching operations
- Prepare for low voltage switching operations
- Perform low voltage switching operations
- 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 to carry out Low Voltage Switching Operations

1.1 Identify the correct work location using available information

1.2 Conduct a site-specific risk assessment, completing required documentation in line with company procedures and 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, number of switching operations and sequence of tasks

1.4 Inform all affected parties of their intended work plan, in line with company procedures

Outcome 2: Prepare to carry out low voltage switching operations

2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety requirements

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs/barriers, control/removal of hazards, prevention of unauthorised access)

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 Identify the low voltage circuit to be worked on, including its points of isolation, using relevant information in line with company policy and procedures

2.6 Identify and inspect the apparatus to be worked on, in line with company policy and procedures

2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out low voltage switching operations

3.1 Perform the switching operation using selected tools and equipment, in line with the work plan, risk assessment and company procedures. Evidence to include **four** of the following switching operations performed on separate occasions on a **live** low voltage network:

- Removal of mains LV fuses
- Insertion of mains LV fuses
- Connection of LV links
- Disconnection of LV links
- Opening LV isolator
- Closing LV isolator

3.2 Perform all relevant testing procedures in line with company procedures

3.3 Confirm the completed switching operation has met the requirements of the work plan

3.4 Record and report the switching operation in line with company 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:

- Environmental site conditions
- Equipment condition
- Electrical testing
- Voltage/current loading
- Access/egress restrictions
- 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 Complete all required post activity documentation in line with company policy

3.8 Ensure all tools and equipment are stored safely and appropriately in line with company 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 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 undertaking 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 The sequence of processes and procedures that need to be followed and applied when performing switching operations

5.11 How to recognise and report inaccurate and incorrect work instructions and documentation

Unit 064 High voltage switching operations

This unit is about high voltage switching operations in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed switching operation meets the standards set by the organisation. It also involves the rigorous application of rules, regulations and work instructions to ensure that work is performed and completed safely without causing risk of injury to self and others.

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

- Plan for high voltage switching operations
- Prepare for high voltage switching operations
- Perform high voltage switching operations
- 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 to undertake high voltage switching operations

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 assessment, taking into account factors such as location, content, number of switching operations 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 undertake high voltage switching operations

2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety regulations

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs, inform others of activities/whereabouts, control/removal of hazards)

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 Identify the circuit to be worked on, including its points of isolation, using relevant information in line with company policy and procedures

2.6 Identify and inspect the apparatus to be operated, in line with company policy and procedures

2.7 Inform system control of the intention to commence the switching operation in line with company procedures

2.8 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out high voltage switching operations

3.1 Perform the switching operations of a network using selected tools and equipment, in line with the work plan, risk assessment and company procedures. Switching operations to include **three** from the following:

- HV switchgear
- HV circuit Breaker
- HV protection
- HV fuses
- HV isolator/sectionaliser

3.2 Confirm the completed switching operation has met the requirements of the work plan

3.3 Record the switching operation in line with company procedures

3.4 Report the completion of the switching operation with system control in accordance with company 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:

- Equipment/apparatus
- Environmental/site conditions
- Safety issues
- Electrical loading
- 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 Complete all required post activity documentation in line with company policy

3.8 Ensure all tools and equipment are stored safely and appropriately in line with company 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 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 undertaking 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 The sequence of processes and procedures that need to be followed and applied when performing switching operations

5.11 How to recognise and report inaccurate and incorrect work instructions and documentation.

Unit 065 LV cable fault location and diagnosis

This unit is about locating and diagnosing faults on plant and apparatus in an electricity power utility environment. It involves the rigorous use and application of diagnostic tools and techniques to establish the route cause of a fault. It also involves making recommendations on what actions need to be taken to rectify the fault.

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

- Plan to locate and diagnose faults
- Prepare to locate and diagnose faults
- Locate and diagnose faults
- Restore and reinstate work location
- 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 to locate and diagnose faults on LV cable

1.1 Identify the correct work location using available information

1.2 Conduct a site-specific risk assessment, completing required documentation in line with company procedures and health and safety regulations

1.3 Plan the work to be undertaken to comply with company policy and procedures and in line with risk assessment requirements, 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 locate and diagnose faults on LV cable

2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety requirements

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs/barriers, control/removal of hazards, traffic control)

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 Identify the low voltage circuit to be worked on, including its points of isolation, using relevant information in line with company policy and procedures

2.6 Identify and inspect the apparatus to be tested, in line with company policy and procedures

2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the location and diagnosis of faults on LV cable

3.1 Review and use all relevant information on the symptoms and problems associated with the fault

3.2 Perform diagnostic operations using selected tools and equipment to determine the type and position of **two** different types of fault. Evidence to including the use of **all** of the following diagnostic techniques (e.g. two techniques on one type of fault and two on another):

- Visual examination
- Physical examination
- Electrical testing
- Interpretation of information from plans

3.3 Use diagnostic equipment to diagnose low voltage faults using at least **two** of the following pieces of equipment on separate occasions -

- Pulse echo devices
- Insulation resistance tester
- Fault burner
- Capacity discharge tester
- Grumbler cable
- Sniffer

3.4 Conduct all diagnostic operations in line with the work plan, risk assessment and company procedures.

3.5 Identify and locate the fault and recommend actions needed to effect the repair

3.6 Record and report the operation in line with company procedures

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:

- Fault identification
- Safety issues
- Access/egress restrictions
- Equipment/materialse
- Environment/site conditions

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 Complete all required post activity documentation in line with company policy

3.10 Ensure all tools and equipment are stored safely and appropriately in line with company procedures

3.11 Ensure hazardous and 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 The processes, 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 and maintain fault diagnosis tools and equipment

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 fault finding and diagnostic tools, techniques and procedures should be used for a given purpose and situation

5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

Unit 066 Fibre optic fusion splicing and terminations

This unit is about performing fibre optic fusion splicing and terminations 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 to undertake fibre optic fusion splicing and termination
- Prepare to undertake fibre optic fusion splicing and terminations
- Carry out fibre optic fusion splicing and terminations
- 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 to undertake fibre optic fusion splicing and termination

1.1 Identify the correct work location using available information

1.2 Conduct a site-specific risk assessment, completing required documentation in line with company procedures and health and safety regulations

1.3 Plan the work to be undertaken to comply with company policy and procedures and in line with risk assessment requirements, 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 undertake fibre optic fusion splicing and termination

2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety requirements

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs/barriers, control/removal of hazards)

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 Identify and inspect the fibre optic circuit to be worked on, including its point of isolation using relevant information in line with company policy and procedures

2.6 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out fibre optic fusion splicing and termination

3.1 Perform fibre optic fusion operations, using selected tools and equipment, in line with work plan, risk assessment and company procedures. Evidence to include **two** separate operations using **one** of the following jointing techniques:

- Arc fusion
- Mechanical

and **one** of the following cable types:

- Single mode
- Multi mode

3.2 Perform relevant testing procedures in line with company procedures

3.3 Check the finished product is compliant with the work specification and meets company

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:

- Core mismatch
- End face separation on connector
- Rough surface on fibre
- Incorrect separation on connector
- Equipment/materials
- Environmental/site conditions

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 Complete all required post activity documentation in line with company policy

3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures

3.8 Ensure hazardous and 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 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

Unit 067 Phasing out of HV cables

This unit is about coordinating the work activities of those responsible for phasing out high voltage cables in an electrical power engineering environment. It involves making sure that the procedures and work instructions used to complete this work are followed and applied rigorously and safely and that the finished work meets the quality assurance and operating requirements set by the organisation.

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

- Plan to phase out cables
- Prepare to phase out cables
- Phase out cables
- 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 to phase out HV cables

1.1 Identify the correct work location using available information

1.2 Conduct a site-specific risk assessment, completing required documentation in line with company procedures and health and safety regulations

1.3 Plan the work to be undertaken to comply with company policy and procedures and in line with risk assessment requirements, 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 phase out HV cables

2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with work plan, risk assessment and health and safety requirements

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs/barriers, demarcation, control/removal of hazards

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 Identify the circuit to be worked on, using relevant information in line with company policy and procedures

2.6 Identify and inspect the HV cable to be worked on, in line with company policy and procedures

2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the Phasing out of HV cables

3.1 Perform phasing out operations on high voltage cables using selected tools and equipment, in line with the work plan, risk assessment and company policy and procedures. Evidence to include **three** different company approved phasing out operations.

3.2 Record and report the results of the phasing out operations in line with company procedures

3.3 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:

- Cable condition
- Access/egress
- Phasing identification
- Environmental/site conditions

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 Complete all required post activity documentation in line with company policy

3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures

3.8 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 How to read and interpret procedures and information sources to make sure that tools and equipment are fit for purpose and safe to use

5.2 What personal protective equipment needs to worn when undertaken work activities

5.3 What materials and substances are dangerous and hazardous to health

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 devise deliverable work plans that reflect the skills and competencies of the individual and the work team

5.9 How to read, interpret and apply work instructions and procedures for the phasing out of cables

5.10 How to follow procedures to procure equipment and resources required to complete phasing out of cable activities

5.11 How to recognise and report inaccurate and incorrect work instructions and documentation

Unit 068 Inspect and maintain oil and gas filled cable systems

This unit is about inspecting and maintaining oil and gas filled cable systems 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 and maintain oil and gas filled cable systems
- Prepare to inspect and maintain oil and gas filled cable systems
- Inspect and maintain oil and gas filled cable systems
- 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 to inspect and maintain oil and gas filled cable systems

1.1 Identify the correct work location using available information

1.2 Conduct a site-specific risk assessment, completing required documentation in line with company procedures and health and safety regulations

1.3 Plan the work to be undertaken to comply with company policy and procedures and in line with risk assessment requirements, 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 inspect and maintain oil and gas filled cable systems

2.1 Select, inspect and wear personal protective equipment (PPE) compatible with work plan, risk assessment and health and safety requirements

2.2 Apply appropriate control measures in line with risk assessment requirements and company procedures to ensure the work area is in a safe and suitable condition for work to be undertaken (e.g. signs/barriers, demarcation, control/removal of hazards)

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 Identify the circuit to be worked on, including its points of isolation, using relevant information in line with company policy and procedures

2.6 Identify and inspect the cable to be worked on, in line with company policy and procedures

2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the inspection and maintenance of oil and gas filled cable systems

3.1 Inspect and maintain the identified cable system using selected tools and equipment, in line with the work plan, risk assessment and company procedures. Evidence to include at least **one** of the following procedures, performed on **two** separate occasions:

- Check pressure on a gas filled system
- Check pressure on an oil filled system
- Check the integrity of cable sheath bonding

3.2 Perform relevant testing operations in line with company procedures

3.3 Record and report relevant test results, in line 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:

- Oil pressure
- Access/egress
- Condition of equipment
- Integrity of cross bonding compromised
- Environmental/site conditions

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 Complete all required post activity documentation in line with company policy

3.7 Ensure all tools and equipment are stored safely and appropriately in line with company procedures

3.8 Ensure hazardous and 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 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

Useful contacts

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Published by City & Guilds
1 Giltspur Street
London
EC1A 9DD
www.cityandguilds.com

City & Guilds is a registered charity established to promote education and training

WW-05-2343