

Level 2 Diploma in Electrical Power Engineering - Substation Plant (2339-21)



Accreditation number: 600/1671/1

Unit Handbook

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1 About this document

This document contains the unit titles, accreditation numbers and content for the Level 2 Diploma in Electrical Power Engineering - Substation Plant.

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 qualifications and credit framework (QCF).

The unit accreditation numbers appear in brackets next to the title, followed by the QCF credits attached to the unit.

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

- Mandatory units (001-003, 005-006)
- Optional units (004, 007-018)

To achieve the full qualification learners must achieve **19** credits from the mandatory units and a minimum of **34** credits from the optional units.

All of the performance criteria must be evidenced. In the case of each 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 national vocational qualification (NVQ).

Unit 001

Working Safely in the Power sector (L/600/3898) 4 credits

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 eg 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

Unit 002

Working Efficiently and Effectively in the Power sector (R/600/3899) 2 credits

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: Recognises problem 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 (R/600/3904) 3 credits

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 moving cable, plant and apparatus in an electrical power engineering environment. 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 cable, plant and apparatus
- Prepare for the movement of cable, plant and apparatus
- Move, secure and position cable, plant and 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 move cable, 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 cable, 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 drums, Link boxes, Transformer, Switchgear, Panels, Street furniture, Over 25 kV joints)
- 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 cable, 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 you **must** also incorporate the following additional requirements in the process of moving the **three** different loads identified in the unit:

- Use safely at least **three** of the following pieces of equipment:
 - Slings
 - Shackles
 - Chain Lifts
 - Winches/Hoists
 - Rollers
 - Ratchet Straps
 - Pull Lifts
 - Tirfors
 - Ropes
 - Other Mechanical Aids
- Incorporate the use of powered lifting equipment on at least **one** occasion:
 - 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 006

Access, Egress and Movement in Substations (L/600/3917) 4 credits

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 egress 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 electrical and functional testing of fitting plant and apparatus 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 fitting plant and apparatus
- Prepare to test fitting plant and apparatus
- Test fitting plant and 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: Be able to plan for work activities to test fitting 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 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 line with company procedures

Outcome 2: Be able to prepare resources to test fitting plant and apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards)
- 2.3 Select and prepare tools and testing equipment compatible with the work plan, risk assessment and company procedures
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.5 Identify and inspect the plant and/or apparatus to be worked on in line with company procedures and work plan
- 2.6 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 fitting plant and apparatus

- 3.1 Use the selected testing equipment to carry out the work in line with work plan, risk assessment and company procedures. To include **six** of the following tests: Polarity, Insulation resistance, Earth impedance, Three phase testing, Phase rotation, Continuity, Ductor test, Contact wipe, Contact Alignment, SF6 pressure testing, Dielectric oil testing, Buchholz test
- 3.2 Confirm and correctly interpret the results of the testing operations

- 3.3 Record the results of the testing in line 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: Earth reading, Voltage fluctuation, Phase rotation, Polarity, Inappropriate test results
- 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/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 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 installing distribution substation plant and apparatus in an electrical power engineering environment. It involve 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 distribution substation plant apparatus
- Prepare to install distribution substation plant and apparatus
- Install distribution substation plant and 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: Be able to plan for work activities to install distribution substations 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 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 line with company procedures

Outcome 2: Be able to prepare resources to install distribution substations plant and apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards, contamination protection)
- 2.3 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan, risk assessment and company procedures
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.6 Identify and inspect the plant and/or apparatus to be worked on in line with company procedures and work plan
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Be able to carry out the installation distribution substations plant and apparatus

- 3.1 Install the identified plant or apparatus using selected tools and equipment, in line with the work plan, risk assessment and company procedures. Installation to include **three** of the

following: Transformer, Switchgear, Package sub station, LV frames, Panel wiring, Battery and charger, Cable installations, LV apparatus, Automation equipment, Switchgear housing, Busbar installations, Compressed air equipment

- 3.2 Check the finished product is compliant with required specifications
- 3.3 Perform testing procedures to ensure the installation meets company operational requirements. Evidence to include **both** of the following: a) Operation of equipment, b) Electrical testing
- 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: Proximity to live equipment, Tools/equipment/materials, Environmental/site conditions, 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 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/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 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 distribution substation plant and apparatus 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 distribution substation plant and apparatus
- Prepare to dismantle distribution substation plant and apparatus
- Dismantle distribution substation plant and 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 dismantle distribution substation 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 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 line with company procedures

Outcome 2: Prepare resources to dismantle distribution substation plant and apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards, contamination protection)
- 2.3 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan, risk assessment and company procedures
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.6 Identify and inspect the plant and/or apparatus to be worked on in line with company procedures and work plan
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the dismantling distribution substation plant and apparatus

- 3.1 Dismantle the identified equipment, ensuring any stored energy is safely released using selected tools and equipment, in line with company procedures. Dismantling to include

three of the following: Transformer, Switchgear, Package sub station, LV frames, Panel wiring, Battery and charger, Cable installations, LV apparatus, Automation equipment, Switchgear housing, Busbar installations, Compressed air equipment

- 3.2 Remove dismantled equipment in accordance with work instructions and company procedures ensuring suitable precautions are taken to prevent damage
- 3.3 Check the completed dismantlement is compliant with the required specifications, in line with company procedures
- 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: Proximity to live equipment, Tools/equipment/materials, 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 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 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
- 5.2 What processes and procedures need to be followed and complied with when 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 dismantle plant and apparatus using specified assemble principles, methods, processes and procedures
- 5.11 What handling techniques and equipment to adopt and use when dismantling plant and apparatus
- 5.12 How to recognise and report inaccurate and incorrect work instructions and documentation

Unit 010

Maintain Distribution Substation Plant and Apparatus (D/600/3923) 15 credits

This unit is about maintaining distribution substation plant and apparatus 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 distribution substation plant and apparatus
- Prepare to maintain distribution substation plant and apparatus
- Maintain distribution substation plant and 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: Be able to plan for work activities to maintain distribution substation 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 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 line with company procedures

Outcome 2: Be able to prepare resources to maintain distribution substation plant and apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards, contamination protection)
- 2.3 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.4 Select and prepare tools and equipment compatible with the work plan, risk assessment and company procedures
- 2.5 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.6 Identify and inspect the plant and/or apparatus to be worked on in line with company procedures and work plan
- 2.7 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Be able to carry out the maintenance distribution substation plant and apparatus

- 3.1 Maintain the identified plant or apparatus using selected tools and equipment, in line with the work plan, risk assessment and company procedures. Evidence to include **three** of the following: Oil filled circuit breakers, Oil filled switchgear, SF6 switchgear, Transformers, Vacuum equipment, Air blast circuit breakers, LV equipment
- 3.2 Check the finished product is compliant with maintenance specifications and work instruction requirements
- 3.3 Perform testing procedures in line with company procedures to ensure the completed maintenance meets company operational requirements.
- 3.4 Record and report the maintenance work 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: Proximity to live equipment, Defective equipment/materials, 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 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 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 incorporate the following additional requirement in the process of the **three** different maintenance activities selected from the unit:

- Maintain plant and apparatus in **both** indoor and outdoor locations, in line with work plan, risk assessment and company procedures (e.g. **two** maintenance activities indoors and **one** outdoors).

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

Unit 011

Inspection and Maintenance of Battery Systems (H/600/3924) 8 credits

This unit is about inspecting and maintaining battery 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 battery systems
- Prepare to inspect and maintain battery systems
- Inspect and maintain battery 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: Be able to plan for work activities to inspect and maintain battery 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 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 line with company procedures

Outcome 2: Be able to prepare resources to inspect and maintain battery systems

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards)
- 2.3 Select and prepare tools and testing equipment compatible with the work plan, risk assessment and company procedures
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.5 Identify the correct battery system to be worked on in line with company procedures and work plan
- 2.6 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Be able to carry out the inspection and maintenance of battery systems

- 3.1 Inspect and maintain battery systems on **two** different occasions, using selected tools and equipment, in line with the work plan, risk assessment and company procedures
- 3.2 Check the finished product is compliant with maintenance specifications and work instruction requirements

- 3.3 Perform testing procedures in line with company procedures to ensure the completed maintenance meets company operational requirements. Evidence to include **three** of the following: Battery voltage/current, Cell specific gravity, Discharge, Battery charger, Other relevant testing procedure
- 3.4 Confirm and interpret the results of the testing operations
- 3.5 Record and report the test results, in line 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: Poor test results, Damage/corrosion/leakage, Congested/hazardous areas, 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 Complete all required post activity documentation in line with company policy
- 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 012

Substation Earthing Installation and Testing (K/600/3925) 8 credits

This is about substation earthing installation and testing 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 install and test earthing materials
- Prepare to install and test earthing materials
- Install and test earthing materials
- 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 test earthing materials

- 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, 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 test earthing materials

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards)
- 2.3 Select and prepare tools and testing equipment compatible with the work plan, risk assessment and company procedures
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.5 Identify and inspect the plant/apparatus to be worked on in line with company procedures and work plan
- 2.6 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the installation and testing of earthing materials

- 3.1 Install earthing materials in **two** different substation locations using the selected tools, equipment and materials in line with the work plan, risk assessment and company procedures
- 3.2 Check the finished product is compliant with maintenance specifications and work instruction requirements

- 3.3 Perform testing procedures in line with company procedures to ensure the completed work meets company operational requirements.
- 3.4 Record and report the test results, 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: Poor test results, Difficult ground conditions, Congested/hazardous areas
- 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 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

Unit 013

Install Primary/EHV Substation Plant and Apparatus (T/600/3927) 15 credits

This unit is about installing primary/extra high voltage substation plant and apparatus 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 primary/EHV substation plant and apparatus
- Prepare to install primary/EHV substation plant and apparatus
- Install primary/EHV 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 work activities to install primary/EHV substation 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 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 line with company procedures

Outcome 2: Prepare resources to install primary/EHV substation plant and apparatus

- 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 to ensure the work area is in a safe and suitable condition for work to be undertaken 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)
- 2.3 Identify the equipment to be worked on, in line with company procedures and work plan
- 2.4 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.5 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.6 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company 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 installation primary/EHV substation plant and apparatus

- 3.1 Install plant and apparatus using selected tools and equipment, in line with work plan, risk assessment and company procedures. Installation to include **three** of the following: Transformer, Switchgear, Cable installations, Bus bars, Circuit breakers, Neutral Earthing Resistor, Isolators, Interrupter heads, Panel wiring, TX dehydration

- 3.2 Check the finished product is compliant with specifications and work instruction requirements
- 3.3 Perform testing procedures in line with company procedures to ensure the completed work meets company operational requirements, 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: Proximity to live equipment, Defective tools/equipment/materials, Environmental/site conditions, 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 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/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 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

Unit 014

Dismantle Primary/EHV Substation Plant and Apparatus (A/600/3928) 15 credits

This unit is about dismantling primary/extra high voltage substation plant and apparatus 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 primary/EHV substation plant and apparatus
- Prepare to dismantle primary/EHV substation plant and apparatus
- Dismantle primary/EHV substation plant and 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 dismantle primary/EHV substation 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 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 line with company procedures

Outcome 2: Prepare resources to dismantle primary/EHV substation plant and apparatus

- 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 to ensure the work area is in a safe and suitable condition for work to be undertaken 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)
- 2.3 Identify the correct equipment to be worked on, in line with company procedures and work plan
- 2.4 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.5 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.6 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company 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 dismantling of primary/EHV substation plant and apparatus

- 3.1 Dismantle the identified equipment, ensuring any stored energy is safely released using selected tools and equipment, in line with company procedures. Dismantling to include

- three** of the following: Transformer, Switchgear, Cable installations, Bus bars, Circuit breakers, Neutral Earthing Resistor, Isolators, Busbar installations
- 3.2 Remove dismantled equipment in accordance with work instructions and company procedures ensuring suitable precautions are taken to prevent damage
 - 3.3 Check the completed dismantlement is compliant with the required specifications, in line with company procedures
 - 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: Proximity to live equipment, Defective tools/equipment/materials, 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 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 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 015

Maintain Primary/EHV Substation Plant and Apparatus (F/600/3929) 15 credits

This unit is about maintaining primary/extra high voltage substation plant and apparatus 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 primary/EHV substation plant and apparatus
- Prepare to maintain primary/EHV substation plant and apparatus
- Maintain primary/EHV substation plant and 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 primary/EHV substation 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 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 line with company procedures

Outcome 2: Prepare resources to maintain primary/EHV substation plant and apparatus

- 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 to ensure the work area is in a safe and suitable condition for work to be undertaken 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)
- 2.3 Identify the correct equipment to be worked on, in line with company procedures and work plan
- 2.4 Confirm the system is safe to work on, including points of isolation and earthing arrangements, in accordance with company procedures
- 2.5 Select and prepare tools and equipment compatible with the work plan and risk assessment
- 2.6 Check the tools and equipment are fit for purpose to carry out the identified work in accordance with company 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 maintenance of primary/EHV substation plant and apparatus

- 3.1 Maintain plant or apparatus using selected tools and equipment, in line with work plan, risk assessment and company procedures. Evidence to include **three** of the following: Transformer, Circuit breaker, Switchgear, Tap changer, Busbar, Neutral Earthing Resistor, Isolators, Interrupter heads, TX dehydration
- 3.2 Check the finished product is compliant with maintenance specifications and work instruction requirements
- 3.3 Perform testing procedures in line with company procedures to ensure the completed maintenance meets company operational requirements.
- 3.4 Record and report the maintenance work in line with company procedures
- 3.5 Conduct a dielectric oil test on one occasion, in line 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: Proximity to live equipment, Defective equipment/materials, Environmental/site conditions, Effects of other people
- 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 Complete all required post activity documentation in line with company policy
- 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 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

Unit 016

Fault Repair of Distribution and HV Substation Plant/Apparatus (T/600/3930) 20 credits

This unit is about fault repair of distribution and HV substation plant and apparatus 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 organization

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

- Plan to repair faults on substation plant and apparatus
- Prepare to repair faults on substation plant and apparatus
- Repair faults on substation plant and 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 repair faults on substation plant/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 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 on substation plant/apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards)
- 2.3 Select and prepare tools and testing equipment compatible with the work plan, risk assessment and company procedures
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.5 Identify and inspect the equipment to be worked on in line with company procedures and work plan
- 2.6 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry out the repair faults on substation plant/apparatus

- 3.1 Perform fault repairs using selected tools and equipment, in line with the work plan, risk assessment and company procedures on **two** separate occasions. Evidence to include **two** of the following: HV apparatus, LV apparatus, Transformer, Switchgear, Circuit breakers, Neutral Earthing Resistor, Isolators, Interrupter heads, Panel wiring, TX dehydration, Tap changer, Compressors, Ancillary equipment

- 3.2 Check the repair work is compliant with required specifications, in line with company procedures
- 3.3 Perform testing operations in line with the work plan, specifications and company procedures
- 3.4 Record and report the repair work 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: Plant/apparatus, Environmental conditions, Substation Conditions, Safety or earthing/bonding arrangements, 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 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 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

Unit 017

Inspection of Substation Plant and Apparatus (A/600/3931) 6 credits

This unit is about inspecting substation plant and apparatus 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 substation plant and apparatus
- Prepare to inspect substation plant and apparatus
- Inspect substation plant and 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 inspect substation plant and apparatus

- 1.1 Identify the correct sub station to be inspected 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 line with company procedures

Outcome 2: Prepare resources to inspect substation plant and apparatus

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) in line 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, equipment are fit for purpose to carry out the identified work in line 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 inspection of substation plant and apparatus

- 3.1 Conduct a pre-entry inspection of the identified substation in line with the work plan, risk assessment and company procedures. Evidence to include the inspection of **two** different substation locations
- 3.2 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 (e.g. Prevention of unauthorised access, Signs/barriers, Demarcation of routes/work areas, Control/removal of hazards)
- 3.3 Identify the correct plant or apparatus to be inspected, in line with company procedures and work plan
- 3.4 Conduct an inspection of the identified sub station plant and apparatus, using selected tools and equipment, in line with company procedures. Evidence to include **three** of the following:

Transformers, HV Switchgear, LV apparatus, Bus-bar installations, Earthing, Neutral Earthing Resistor, Cables, Battery installations, Site Conditions

- 3.5 Record and report substation inspection outcomes in accordance with company policy
- 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 Complete all required post activity documentation in line with company policy
- 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 be worn when undertaking 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 to read and analyse inspection data, interpret and record findings
- 5.13 How to recognise and report inaccurate and incorrect work instructions and documentation

Unit 018

Maintain Compressed Air Systems (F/600/3932) 6 credits

This unit is about maintaining compressed air systems 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 compressed air systems
- Prepare to maintain compressed air systems
- Maintain compressed air 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 for work to maintain compressed air 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 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 line with company procedures

Outcome 2: Prepare resources to maintain compressed air systems

- 2.1 Select, inspect and wear Personal Protective Equipment (PPE) compatible with the work plan, risk assessment and health and safety regulations
- 2.2 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, demarcation of work area, control/removal of hazards)
- 2.3 Select and prepare tools and testing equipment compatible with the work plan, risk assessment and company procedures
- 2.4 Check the tools and equipment are fit for purpose to carry out the identified work in line with company procedures
- 2.5 Identify and inspect the equipment and system to be maintained in line with company procedures and work plan
- 2.6 Report faults with tools, equipment and PPE, including that which is unavailable, in line with company procedures

Outcome 3: Carry Maintenance of compressed air systems

- 3.1 Maintain **two** different compressed air systems using selected tools and equipment, in line with the work plan, risk assessment and company procedures
- 3.2 Ensure any stored energy is released safely, where applicable, in line with company procedures

- 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 maintenance meets company requirements.
- 3.5 Record and report the maintenance work in line 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: Equipment, Material, Test failure, System conditions, Environmental/site conditions, Effects of other people
- 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 Complete all required post activity documentation in line with company policy
- 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 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

Useful contacts

UK learners General qualification information	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com
International learners General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: intcg@cityandguilds.com
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) E: singlesubjects@cityandguilds.com
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: intops@cityandguilds.com
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 E: business@cityandguilds.com
Publications Logbooks, Centre documents, Forms, Free literature	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413

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feedbackandcomplaints@cityandguilds.com

City & Guilds

1 Giltspur Street

London EC1A 9DD

T +44 (0)844 543 0000

F +44 (0)20 7294 2413

www.cityandguilds.com

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in England and Wales (company
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