

# Level 3 Diploma in Electrical Power Engineering (2339-30)

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## Qualification at a glance

<b>Subject area</b>	<b>Electrical Power Engineering</b>
<b>City &amp; Guilds number</b>	2339
<b>Age group approved</b>	16-18, 19+
<b>Entry requirements</b>	N/a
<b>Assessment</b>	Portfolio
<b>Support materials</b>	Centre handbook Unit pack
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last dates

<b>Title and level</b>	<b>City &amp; Guilds number</b>	<b>Accreditation number</b>
Level 3 Diploma in Electrical Power Engineering	2339-30	601/2519/6



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## 1 Introduction

This document tells you what you need to do to deliver the qualifications:

<b>Area</b>	<b>Description</b>
Who are the qualifications for?	They are for learners who work or want to work as either Jointers, Fitters, Overhead Linesperson's or Technician's in the power sector
What do the qualifications cover?	They allow learners to learn, develop and practise the skills required for employment and/or career progression in the power sector covering a wide range of units from live low voltage overhead line connections and the installation of substation plant and apparatus to controlling working parties and producing, communicating and recording technical information for work on power networks
Are the qualifications part of a framework or initiative?	They serve as competence based qualifications for the Modern Apprenticeship, in the EU Skills Apprenticeship framework.
Who did we develop the qualification with?	They were developed in association with EU Skills and with power sector employers in Scotland.
What opportunities for progression are there?	They allow learners to progress into employment within the Power sector from a Fitter to a Technician.

## Structure

To achieve the **Level 3 Diploma in Electrical Power Engineering 601/2519/6**, learners must achieve **21** credits from the mandatory group, a minimum of **14** credits from mandatory optional group A and a minimum of **13** credits from mandatory optional group B (group B1), or a minimum of **16** credits from mandatory optional group B (group B2), or a minimum of **15** credits from mandatory optional group B (group B3), or a minimum of **15** credits from mandatory optional group B (group B4). Learners can make up the remaining credits from either optional group A, B or C to total a minimum of **81** credits.

<b>Unit accreditation number</b>	<b>City &amp; Guilds unit number</b>	<b>Unit title</b>	<b>Credit value</b>	<b>Unit Level</b>
<b>Mandatory</b>				
K/505/9272	201	Comply with statutory regulations and organisational safety requirements	7	2
M/505/9273	360	Minimise risk to life, property and the environment	14	3
<b>Optional A</b>				
T/505/9274	361	Control of working parties	14	3
A/505/9275	380	Co-ordinate work activities on plant and apparatus	17	3
<b>Optional B</b>				
<b>Overhead Linesperson B1</b>				
F/505/9276	364	Install overhead line plant and equipment	16	3
J/505/9277	369	Maintain overhead plant and equipment	13	3
<b>Fitter B2</b>				

L/505/9278	416	Install substation plant and apparatus	17	3
R/505/9279	377	Maintain substation switchgear	16	3
<b>Jointer B3</b>				
J/505/9280	371	Low voltage distribution cable jointing	15	3
L/505/9281	374	High voltage distribution underground cable jointing	15	3
<b>Technician B4</b>				
R/505/9282	382	Organise the use of resources for work on power networks	17	3
H/505/9285	383	Produce, communicate and record technical information for work on power networks	15	3
<b>Optional C</b>				
T/505/9288	215	Access, movement and egress of high voltage overhead line work areas	1	2
T/505/9291	216	Inspection and maintenance of battery systems	7	2
Y/505/9302	217	Install substation earthing	7	2
K/505/9305	218	Access, movement and egress of high voltage substation work areas	1	2

M/505/9306	362	Co-ordinate the mechanical movement of power plant and apparatus	14	3
F/505/9309	363	High voltage switching operations	11	3
F/505/9276	364	Install overhead line plant and equipment	16	3
A/505/9311	365	Dismantle overhead line plant and equipment	16	3
F/505/9312	366	Live low voltage overhead line connections	15	3
J/505/9313	367	Jointing overhead line conductors	13	3
R/505/9315	368	Install overhead line conductors	13	3
J/505/9277	369	Maintain overhead plant and equipment	13	3
Y/505/9316	370	Inspection of overhead line routes	6	3
J/505/9280	371	Low voltage distribution cable jointing	15	3
D/505/9317	372	Low voltage consac underground cable jointing	15	3
L/505/9281	373	High voltage distribution underground cable jointing	15	3
H/505/9318	374	High voltage polymeric transmission cable jointing	15	3



H/505/9321	375	High voltage pressurised transmission cable jointing	15	3
K/505/9322	376	Dismantle substation plant and apparatus	17	3
R/505/9279	377	Maintain substation switchgear	16	3
M/505/9323	378	Fault repair of substation plant and apparatus	18	3
A/505/9325	379	Maintain compressed air systems	16	3
F/505/9343	381	Develop yourself in the work role	6	3
R/505/9282	382	Organise the use of resources for work on power networks	17	3
H/505/9285	383	Produce, communicate and record technical information for work on power networks	15	3
J/505/9344	384	Low voltage sub-station switching operations	11	3
R/505/9346	385	Diagnostic testing and fault finding on power networks	16	3
K/505/9367	386	Protection testing on overcurrent and earth fault schemes	16	3
Y/505/9347	387	Pressure testing of high voltage distribution equipment	16	3
D/505/9348	388	Install supervisory control and data acquisition (SCADA) systems	4	3

Y/505/9350	389	Install protective relays and metering equipment	4	3
D/505/9351	390	Install high voltage current transformer metering equipment	4	3
H/505/9352	391	Diagnose faults on compressed air systems	10	3
K/505/9353	392	Low voltage cable fault location and diagnosis	13	3
M/505/9354	393	Fibre optic fusion splicing and terminations	4	3
T/505/9355	394	Phasing out of high voltage cables	15	3
A/505/9356	395	Inspect and maintain oil and gas filled cable systems	7	3
F/505/9357	396	Low voltage overhead line switching operations	11	3
J/505/9358	397	Overhead line fault diagnosis	13	3
L/505/9359	398	High voltage Live line operations using insulated rods	4	3
T/505/9369	399	Hot stick operations	4	3
F/505/9360	408	Hot glove operations	15	3
J/505/9361	409	Install overhead line apparatus on steel tower structures	13	3

L/505/9362	410	Fault repair of overhead line apparatus on steel tower structures	13	3
R/505/9363	411	Earthing of overhead line transmission conductors	15	3
Y/505/9364	412	Erection of steel tower structures	10	3
D/505/9365	413	Maintain power transformers	16	3
H/505/9366	414	Maintain supervisory control and data acquisition (SCADA) systems	16	3
A/505/9308	415	Electrical testing of power equipment	15	3
L/505/9278	416	Install substation plant and apparatus	17	3



## 2 Centre requirements

### Approval

#### Approval

Fast track approval is available for 12 months from the launch of the qualification. After 12 months, the Centre will have to go through the standard Qualification Approval Process. The centre is responsible for checking that fast track approval is still current at the time of application.

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the *Centre Manual - Supporting Customer Excellence* for further information.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

### Resource requirements

#### Physical resources and site agreements

Any centre wishing to deliver this qualification must have access to the appropriate plant, apparatus and equipment that will enable learners to obtain the required evidence to achieve the unit and/or diploma.

For this reason it is likely that centres will be either specialist providers or partnered with power sector companies.

On their approval visit the Qualification Consultant (QC) will confirm that centres have the required physical resources with which to deliver the qualification.

#### Centre staffing

In line with the Sector Skills Council (SSC) Energy & Utility's assessment strategy, all assessors, internal quality assurers and qualification consultants involved in the delivery of power sector qualifications must meet the following occupational expertise requirements. They should:

- demonstrate a high level of interpersonal and communication skills, comparable with at least the Key Skills and Core Skills (Communication) identified within "Develop productive working relationships with colleagues" (MSC D1)
- have up-to-date knowledge of current practice and emerging issues within their industry and be aware there may be differences between the four UK countries
- have a thorough understanding of the National Occupational Standards/assessment units for the qualifications they are assessing or verifying and be able to interpret them and offer advice on assessment-related matters

- show experience and working knowledge of the assessment and verification processes relating to the context in which they are working
- demonstrate they have relevant and credible technical and/or industrial experience not more than 5 years old - at a level relevant to their role and the award
- show they are able to act as an emissary of the awarding body and be able to facilitate consistency across centres
- demonstrate a commitment to continuing professional development and to keeping abreast of the changing environment and practices in their industry
- demonstrate they have relevant and credible technical and/or industrial experience within the industry appropriate to these contexts – wind turbine installation and commissioning.

Centre staff may undertake more than one role, e.g. tutor and assessor or internal quality assurer, but cannot internally verify their own assessments.

### **Assessors and Internal Quality Assurer**

Centre staff should hold (A or V units or D units), or be working towards, the relevant Assessor/Internal Quality Assurer TAQA qualification for their role in delivering, assessing and verifying these qualifications and meet the relevant experience requirements outlined above.

### **Continuing professional development (CPD)**

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

### **Learner entry requirements**

City & Guilds does not set entry requirements for these qualifications. However, centres must ensure that learners have the potential and opportunity to gain the qualifications successfully.

### **Age restrictions**

City & Guilds cannot accept any registrations for learners under 16 as this these qualifications are not approved for under 16s.



## 3 Delivering the qualification

### Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualifications.
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualification[s], their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

### Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

City & Guilds endorses several ePortfolio systems, including our own, **Learning Assistant**, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: [www.cityandguilds.com/eportfolios](http://www.cityandguilds.com/eportfolios).

City & Guilds has developed a set of *Recording forms* including examples of completed forms, for new and existing centres to use as appropriate. *Recording forms* are available on the City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the qualification consultant, before they are used by candidates and assessors at the centre. Amendable (MS Word) versions of the forms are available on the City & Guilds website.



## 4 Assessment

Candidates must:

- have a completed portfolio of evidence for each unit

These new qualifications are accredited as competence-based qualifications and require the overwhelming majority of evidence to be collected from the workplace. The assessment methods therefore have not deviated from the previous NVQ, where evidence to meet the requirements of the standards was gathered by the candidate from the work-place and compiled into a portfolio of evidence, which was validated by the approved assessor and internal verifier subject to City & Guilds' external verification.

These diplomas have been designed to offer choices and progression which recognise candidate competence in working within the four main occupational contexts (Overhead Linesperson, Fitter, Joiner, and Technician).

Details of the scope and range of the unit are provided with each unit. In addition to visits from external verifiers, all centres will be required to submit details of assessment planning arrangements and assessment recording forms and systems - these details must include the planned use and design of simulations that meet the requirements on this type of assessment provided below. The external verifier will determine whether or not these are of an acceptable rigour to ensure satisfactory implementation and recording of assessment. The visits to a centre by an external verifier will be planned in advance.

The following approaches to external quality control are not mandatory as part of the assessment strategy:

- use of independent assessors (moving the candidate): The requirement for workplace evidence means that it would be inappropriate and logistically uneconomic to make use of an assessment system in which candidates were required to attend a different location or assessment centre.
- use of independent assessors (moving the assessor): Candidates for the Electrical Power Engineering diplomas will typically be in low numbers per centre and widely scattered across the UK. Under these circumstances, the mandatory use of peripatetic assessors would be very costly and offer little added value.
- use of independent assessment methods (open written response assessment): Due to the variation of plant, apparatus and equipment this type of assessment would remove the flexibility to assess knowledge at a local level.

## Simulation

The sector skills council (EU Skills) defines simulated activities as those which are carried out without the environment, resources or equipment found within the workplace and involve acting or other scenarios which are not 'real' work tasks. EU Skills has not identified any specific areas in the distribution diplomas that warrant assessment through simulation, however, in the extremely rare instance where it is felt that simulation is required this is only acceptable in relation to those few instances which display one or more of the following characteristics (details of planned simulation must be submitted for approval by centres to their external verifier):

- where health and safety could be compromised by seeking workplace evidence
- where the behaviour or situation under which assessment occurs happens infrequently in the workplace
- where the electricity network, plant or apparatus needs to be placed in an unacceptable operating state to allow for assessment to take place.
- In all cases where the use of evidence from simulations is permitted, this is clearly detailed in the element or unit concerned.

Where simulation is used the environment must be set up to mirror the features of an electricity distribution environment in all of the following aspects:

- nature of the plant, apparatus and equipment
- ambient noise, light and temperature levels
- handling characteristics of materials used
- presence, actions and capabilities of other personnel

Where simulation is used the simulated activity must be designed to mirror the same activity carried out in an electricity distribution environment:

- the urgency with which the activity must be carried out and the time needed to complete it
- the number and sequence of actions needed to complete the activity
- the skills needed to carry out the activity
- the nature and availability of resources needed to carry out the activity
- access to references and sources of advice and assistance that could be needed if problems arise
- the type of documentation to be completed
- the standards to which the activity must be carried out, including any practices and procedures which require to be followed
- the outcomes which the activity will produce.
- centre proposals for the use of simulation should be approved by the Awarding Body in advance of being used and may be rejected if they fail to comply with the characteristics listed above.



## Realistic Working Environments (RWE)

The SSC has provided the following contexts for illustration where assessment in a RWE might be used:

- where demonstration of emergency shutdown and related safety procedures would be dangerous and/or disruptive to plant/environment/individuals; too costly such as total plant shutdown or dealing with spillage of dangerous substances; where issues of confidentiality restrict access to real work opportunities
- demonstrating specific aspects of the operation which rarely or never occur because of effective quality assurance systems
- the capacity to integrate disparate knowledge to cope with unforeseen events and to solve problems
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of candidate performance

Although it is expected that candidates provide all evidence from the work place, the SSC has identified the following types of activities as being potentially suitable for assessment through RWE (these details of planned simulation must be submitted for approval by centres to their external verifier):

1. planning and preparing for emergency response
2. isolation of the fault and contingency action
3. fault diagnosis and problem causation

The following conditions for assessment in a RWE must be met:

1. assessments must be carried out under realistic work pressures that are found in the normal industry workplace
2. assessments must be carried out in conditions and facilities which are typical of those encountered in the normal industry workplace
3. the range of materials, equipment and tools that candidates use must be up-to date and be of the type routinely found in the normal industry workplace environments.
4. all work carried out should be completed in a way, and to a timescale, that is acceptable in the normal industry workplace
5. candidates must interact with the range of personnel and contractors found in the normal industry workplace
6. candidates must be expected to achieve a volume of work comparable to that expected in the normal work situation being replicated
7. candidates must be given workplace responsibilities that will enable them to meet the requirements of the National Occupational Standards / units of assessment
8. candidates must show their productivity reflects that found in the work situation being replicated the RWE must take into account legislation, regulations, codes of practice, etc, which pertain to the regulated environment
9. the RWE must be managed as a real work situation

### **Recognition of prior learning (RPL)**

Recognition of prior learning means using a person's previous experience or qualifications which have already been achieved to contribute to a new qualification.



## 5 Units

### Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- guided learning hours
- unit aim
- learning outcomes which are comprised of a number of assessment criteria

## Unit 201

# Comply with statutory regulations and organisational safety requirements

<b>UAN:</b>	<b>K/505/9272</b>
<b>Level:</b>	2
<b>Credit value:</b>	7
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about rigorously applying and maintaining organisational processes and procedures to ensure compliance with statutory health and safety regulations and organisational safety rules and policies. It involves the application of knowledge to identify and support the control of hazards to maintain a safe working environment for yourself and others when working in an electrical power environment.

<b>Learning outcome</b>
The learner will: 1. know health and safety statutory regulations and organisational requirements
<b>Assessment criteria</b>
The learner can: 1.1 state the roles and responsibilities of employees and employers in relation to health and safety 1.2 state regulations and safe working practices and procedures 1.3 describe what constitutes a hazard in the workplace 1.4 state risks and employee responsibilities for reducing risks in the workplace 1.5 describe processes and procedures that are used to identify and rate the level of risk 1.6 state the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.7 | state the range of Personal Protective Equipment (PPE) required for the job role                           |
| 1.8 | state the organisational requirements for the safe and secure storage of tools, equipment and materials    |
| 1.9 | describe the limitations of own job responsibility and reporting procedures for any work related problems. |

<b>Learning outcome</b>
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The learner will:
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|----|--|
| 2. | be able to comply with health and safety statutory regulations and organisational requirements |
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<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 2.1 | work in accordance with statutory regulations and organisational requirements specific to job role including: <ul style="list-style-type: none"> <li>a) maintaining a tidy workplace, with exits and gangways free from obstruction</li> <li>b) using equipment safely and for the purpose intended</li> <li>c) observing organisational safety rules, signs and hazard warnings</li> <li>d) taking measures to protect self and others from harm</li> </ul> |
| 2.2 | identify warning signs and labels from the main groups of hazardous substances   |
| 2.3 | identify qualified first aiders and the location of first aid facilities   |
| 2.4 | select and wear Personal Protective Equipment (PPE) required for the job role  |
| 2.5 | identify and control hazards for the following: <ul style="list-style-type: none"> <li>a) within the working environment</li> <li>b) when using equipment</li> <li>c) when using material and substances</li> </ul>  |
| 2.6 | carry out methods of manual lifting and carrying for the following: <ul style="list-style-type: none"> <li>a) when lifting alone</li> <li>b) with assistance of others</li> <li>c) with mechanical assistance.</li> </ul>  |

# **Unit 201            Comply with statutory regulations and organisational safety requirements**

## Supporting information

### **Guidance**

Examples of relevant documents –

- Management of Health and Safety At Work Regulations
- Workplace Health and Safety and Welfare Regulations
- Personal Protective Equipment at Work Regulations
- Manual Handling Operations Regulations
- Provision and Use of Work Equipment Regulations
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
- ESQCR Electricity, Electricity at Work Regulations
- CoSHH Control of Substances Hazardous to Health
- Company Safety Rules
- Company Policies and Procedures

During the assessment the learner will:

1. comply with the appropriate statutory regulations at all times
2. present themselves in the workplace suitably prepared for the activities to be undertaken
3. follow organisational accident and emergency procedures
4. follow organizational procedures in the event of fire and the evacuation of premises

Work related problems: hazardous malfunctions of plant and equipment.

## Unit 215

## Access, movement and egress of high voltage overhead line work areas

<b>UAN:</b>	<b>T/505/9288</b>
<b>Level:</b>	2
<b>Credit value:</b>	1
<b>GLH:</b>	9
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about being able to safely enter, move around and exit overhead line work environments. It involves rigorously complying with organisational safety rules and procedures and using knowledge to support the recognition and avoidance of hazards. It also involves carrying out inspections of site conditions and making judgements on what actions need to be taken to maintain the safety of yourself and others in an electrical power utilities environment.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements to access, move around and egress high voltage overhead line work areas
<b>Assessment criteria</b>
The learner can: 1.1 state the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 state the roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 describe the limitations of own job responsibility and reporting procedures for any work related problems 1.4 state the hazards to be considered when planning to access, move around and egress high voltage overhead line work areas 1.5 state the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others

<ul style="list-style-type: none"> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <ul style="list-style-type: none"> <li>1.6 state the organisational procedures that need to be complied with when accessing, moving around and egressing high voltage overhead line work areas</li> <li>1.7 state the processes and procedures that need to be complied with when receiving a safety document.</li> </ul>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare to access, move around and egress high voltage overhead line work areas
<b>Assessment criteria</b>
The learner can:
2.1 identify the high voltage overhead line work area to be accessed using organisational documentation and work instructions
2.2 apply organisational work documentation to identify the activity to be carried out
2.3 plan the activities required to access, move around and egress the high voltage overhead line work area
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear Personal Protective Equipment (PPE) required for the job role
2.6 inform those who will be directly and indirectly affected by the planned activities.

<b>Learning outcome</b>
The learner will:
3. be able to access, move around and egress high voltage overhead line work areas
<b>Assessment criteria</b>
The learner can:
3.1 access and move around the high voltage overhead line work area in line with organisational procedures
3.2 implement the work plan in line with organisational procedures to meet safe control system requirements
3.3 egress the high voltage overhead line work area in line with the work plan and organisational procedures
3.4 resolve problems within the limits of own job role responsibility
3.5 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will:
4. be able to leave the high voltage overhead line work area in a safe condition in accordance with legislation and Company procedures
<b>Assessment criteria</b>
The learner can:



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| <ul style="list-style-type: none"><li>4.1 store tools and equipment on completion of work activity</li><li>4.2 check the safe condition of the work area.</li></ul> |
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## Unit 215

# Access, movement and egress of high voltage overhead line work areas

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have accessed, moved around and egressed:

- **two** separate Overhead Line work areas

### Guidance

3.1 Control measures may include –safety documentation, informing others of presence, signs / barriers, demarcation, control/removal of hazards

## Unit 216

## Inspection and maintenance of battery systems

<b>UAN:</b>	<b>T/505/9291</b>
<b>Level:</b>	2
<b>Credit value:</b>	7
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about inspecting and maintaining battery systems in an electrical power engineering environment. It involves the rigorous application of organisational processes and procedures to ensure the work is carried out safely and the identification and control of hazards. It also involves the use of inspection techniques, test equipment and tools to carry out and record maintenance operations in line with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the inspection and maintenance of battery systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to inspection and maintenance of battery systems 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to inspect and maintain battery systems 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 describe the organisational procedures for accidents, incidents and emergencies to include:

- a. fire
  - b. injury to self and others
  - c. threat of terrorism
  - d. hazardous occurrences and near misses
- 1.7 explain the organisational procedures that need to be complied with when inspecting and maintaining battery system.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare to inspecting and maintaining battery systems
<b>Assessment criteria</b>
The learner can: 2.1 identify the work location using organisational documentation and work instructions 2.2 apply organisational work documentation to identify the work activity 2.3 plan the activities required to inspect and maintain battery systems 2.4 carry out a site specific risk assessment in accordance with health and safety regulations 2.5 select and wear Personal Protective Equipment (PPE) required for the job role 2.6 inspect suitable tools and equipment for use in line with organisational procedures 2.7 identify the battery system to be inspected in line with organisational procedures 2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will: 3. be able to carry out the inspection and maintenance of battery systems
<b>Assessment criteria</b>
The learner can: 3.1 confirm the system is safe to work on in accordance with organisational procedures 3.2 implement control measures in line with organisational procedures to meet safe control requirements 3.3 inspect and maintain battery systems in line with work plan and organisational procedures 3.4 carry out testing operations in line with organisational procedures 3.5 monitor control measures to ensure risks are minimised 3.6 confirm the finished work meets organisational requirements and quality standards 3.7 record the results of the work implemented in accordance with organisational procedures 3.8 resolve problems within the limits of own job role responsibility

3.9 report problems outside the limits of own responsibility to designated personnel.
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<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and test equipment on completion of work activity
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4.2 check the safe condition of the work area.
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# Unit 216            Inspection and maintenance of battery systems

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that over at least **two** different occasions you have carried out **three** of the following testing procedures:

- Battery voltage/current
- Cell specific gravity
- Discharge
- Battery charger
- Another relevant testing procedure
- Conductance

### Guidance

2.7 Select tools – to include an inspection of condition e.g. insulation

3.2 Control measures may include – identifying points of isolation, barriers, venting and purging

<b>UAN:</b>	<b>Y/505/9302</b>
<b>Level:</b>	2
<b>Credit value:</b>	7
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the installation of substation earthing in an electricity power utilities environment. It involves the rigorous application of organisational processes and procedures to ensure that work is carried out safely. It also involves the use of tools to carry out the installation and test equipment to confirm the completed installation meets the operational requirements set by the organisation.

<b>Learning outcome</b>
The learner will:
1. understand the statutory regulations and procedures to install substation earthing
<b>Assessment criteria</b>
The learner can:
1.1 describe the main principles of health and safety legislation and regulations relating to work on substation plant and apparatus
1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements
1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems
1.4 explain the hazards to be considered when planning to install substation earthing
1.5 explain what materials and substances are hazardous to health in relation to job role
1.6 describe the organisational procedures for accidents, incidents and emergencies to include:
a) fire
b) injury to self and others
c) threat of terrorism
d) hazardous occurrences and near misses

- |     |   |
|-----|---|
| 1.7 | explain the organisational procedures that need to be complied with when installing substation earthing |
| 1.8 | explain the processes and procedures that need to be complied with when receiving a safety document.    |

<b>Learning outcome</b>
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The learner will:
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- |   |
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| 2. be able to plan and prepare to install substation earthing |
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<b>Assessment criteria</b>
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The learner can:
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- |     |   |
|-----|---|
| 2.1 | identify the work location using organisational documentation and work instructions   |
| 2.2 | apply organisational work documentation to identify the work activity   |
| 2.3 | plan the activities required for installing substation earthing   |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                                    |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 | identify and carry out a pre work inspection of the substation equipment to be earthed in line with organisational procedures |
| 2.7 | select suitable tools and equipment required to install substation earthing   |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.  |

<b>Learning outcome</b>
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The learner will:
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- |   |
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| 3. be able to install substation earthing |
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<b>Assessment criteria</b>
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The learner can:
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|-----|--|
| 3.1 | confirm the system is safe to work on in accordance with organisational procedures                         |
| 3.2 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.3 | install substation earthing in line with work plan and organisational procedures                           |
| 3.4 | monitor control measures to ensure risks are minimised   |
| 3.5 | confirm the finished work meets organisational requirements and quality standards                          |
| 3.6 | carry out earth testing procedures in line with work plan and organisational procedures                    |
| 3.7 | record the results of the work implemented in accordance with organisational procedures                    |
| 3.8 | resolve problems within the limits of own job role responsibility  |
| 3.9 | report problems outside the limits of own responsibility to designated personnel.                          |



<b>Learning outcome</b>
The learner will: 4. Be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials 4.3 check the safe condition of the work area.

# Unit 217      Install substation earthing

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that you have:

1. Co-ordinated and carried out the installation of substation earthing on a minimum of **two** separate occasions

### Guidance

2.7 Select and check - to include inspection of tools and equipment

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

3.2 Control measures may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 218

## Access, movement and egress of high voltage substation work areas

<b>UAN:</b>	<b>K/505/9305</b>
<b>Level:</b>	2
<b>Credit value:</b>	1
<b>GLH:</b>	9
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about being able to safely enter, move around and exit electrical substation environments. It involves rigorously complying with organisational safety rules and procedures and using knowledge to support the recognition and avoidance of hazards. It also involves carrying out inspections of site conditions and making judgements on what actions need to be taken to maintain the safety of yourself and others in an electrical power environment.

<b>Learning outcome</b>
The learner will: 1. understand the statutory regulations and procedures required to access, move around and egress high voltage substation work areas
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to high voltage substation work areas 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to access, move around and egress a high voltage substation work area 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when accessing, moving around and egressing high voltage substation work areas</p> <p>1.7 describe the organisational procedures for demarcating a substation work area and the route to and from the work area</p> <p>1.8 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare to access, move around and egress high voltage substation work areas</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the substation using company documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the activity to be carried out</p> <p>2.3 plan the activities required for access and egress within high voltage substation work areas</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear Personal Protective Equipment (PPE) required for the job role</p> <p>2.6 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. be able to access, move around and egress high voltage substation work areas</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 implement control measures in line with organisational procedures to meet safe control system requirements</p> <p>3.2 access, move around and egress substation work areas in line with organisational procedures</p> <p>3.3 monitor control measures to ensure risks are minimised</p> <p>3.4 resolve problems within the limits of own job role responsibility</p> <p>3.5 report problems outside the limits of own responsibility to designated personnel.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>4. be able to leave the work area in a safe condition according to required regulation and legislation</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>4.1 store tools and equipment on completion of work activity</p>

## **Unit 218            Access, movement and egress of high voltage substation work areas**

### Supporting information

#### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have accessed, moved around and egressed:

- **two** separate substation work areas

#### **Guidance**

3.1 Control measures may include –safety documentation, informing others of presence, signs / barriers, demarcation, control/removal of hazards

## Unit 360

## Minimise risk to life, property and the environment

<b>UAN:</b>	<b>M/505/9273</b>
<b>Level:</b>	3
<b>Credit value:</b>	14
<b>GLH:</b>	75
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about minimising risks to life, property and the environment when operating in a power utility engineering environment. It involves rigorously complying with organisational safety rules, processes and procedures and the identification and control of hazards. It also involves organising, communicating and coordinating the activities of others to establish and maintain a safe working environment.

<b>Learning outcome</b>
The learner will: 1. understand the statutory regulations and procedures to minimise risk to life, property and the environment
<b>Assessment criteria</b>
The learner can: 1.1 describe roles and responsibilities of employees and employers in relation to health and safety 1.2 describe regulations and safe working practices and procedures in own role 1.3 identify warning signs and labels from the main groups of hazardous substances 1.4 explain what materials and substances are hazardous to health in relation to job role 1.5 explain what constitutes a hazard in the workplace 1.6 describe the statutory regulations and procedures for minimising risks in relation to: a) fire b) injury to self and others c) threat of terrorism d) the environment.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare control measures to minimise risk to life, property and the environment
<b>Assessment criteria</b>
The learner can: 2.1 identify the work location using company documentation and work instructions 2.2 apply company work documentation to identify the work activity 2.3 carry out a site specific risk assessment in accordance with health and safety regulations 2.4 plan control measures to minimise risk to life, property and the environment 2.5 select and wear Personal Protective Equipment (PPE) required for the job role 2.6 inform those who will be directly and indirectly affected by the intended work plan 2.7 communicate to group members assigned tasks and responsibilities to minimise identified risks.

<b>Learning outcome</b>
The learner will: 3. be able to co-ordinate control measures to minimise risk to life, property and the environment
<b>Assessment criteria</b>
The learner can: 3.1 implement the work plan to minimise identified risks 3.2 monitor control measures to ensure risks are minimised 3.3 record the control measures implemented in accordance with company procedures 3.4 provide information to update safety systems records 3.5 resolve problems within the limits of own job role responsibility 3.6 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 360            Minimise risk to life, property and the environment

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **all** of the following:

- Planned to minimise risk to life, property and the environment
- Determined priorities and monitored risk to life, property and the environment
- Leave the work area in a safe condition
- Used and communicated data and information
- Resolved problems effectively and efficiently.

### Guidance

The evidence may be generated during normal working activities and may include examples of disposal of waste from work activities including packaging and crates, processing of insulating oil, SF6 handling, fuelling and the application and deployment of spill kits.

Candidates should be able to confirm the system to be worked on is safe to work on, including points of isolation and earthing arrangements where applicable, in accordance with company procedures.

Where required candidates should be able to provide guidance to others in ways of minimising risks to life, property and the environment and be able to clarify the impact and implications of measures.

Select: Assessors need to ensure learners inspect PPE is fit for purpose i.e. dates and free from defects.

Others: visitors, general public, co-workers

Arrangements for reinstating



<b>UAN:</b>	<b>T/505/9274</b>
<b>Level:</b>	3
<b>Credit value:</b>	14
<b>GLH:</b>	75
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about organising and controlling the working activities of other persons working in power utility engineering environments. It involves rigorously complying with and enforcing organisational safety rules and operational procedures. It requires the identification of hazards and the planning and implementation of the control measures to deal with them. It also involves planning organising and monitoring the progress of work, giving instruction to others and recording the work activity in line with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand the statutory regulations and procedures required for the control of working parties
<b>Assessment criteria</b>
The learner can: 1.1 describe roles and responsibilities of employees and employers in relation to health and safety 1.2 describe the organisational procedures for the control of working parties 1.3 describe the documentation required for controlling a working party 1.4 describe the authorisations required for controlling a working party 1.5 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.6 describe the range of Personal Protective Equipment (PPE) required for the work group activities 1.7 explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare to control a working party
<b>Assessment criteria</b>
The learner can: 2.1 identify the work location using company documentation and work instructions 2.2 apply company work documentation to identify the work activity 2.3 carry out a site specific risk assessment in accordance with health and safety regulations 2.4 plan control measures to minimise risk to life, property and the environment 2.5 plan the activities required to control the working party 2.6 select and wear Personal Protective Equipment (PPE) required for the job role 2.7 inform those who will be directly and indirectly affected by the intended work plan 2.8 communicate to group members assigned tasks and responsibilities.

<b>Learning outcome</b>
The learner will: 3. be able to control work activities of a working party
<b>Assessment criteria</b>
The learner can: 3.1 confirm the system is safe to work on in accordance with organisational procedures 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements 3.3 monitor the progress of the work plan and control measures to ensure risks are minimised 3.4 instruct the working party to ensure the assigned work is conducted in accordance with the work plan and organisational procedures 3.5 confirm the finished work meets organisational requirements and quality standards 3.6 record the results of the work implemented in accordance with organisational procedures 3.7 provide information to update safety systems records 3.8 resolve problems within the limits of own job role responsibility 3.9 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 361 Control of working parties

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **all** of the following:

- Received relevant company safety documentation
- Carried out the briefing of the working party
- Carried out the management of the working party during work activities
- Controlled the withdrawal of the working party
- Clearing of relevant company safety documentation

### Guidance

Examples of relevant supporting evidence: method statements, working party register, site plans, copy of safety document, Company risk/ hazard assessment documentation.

Team: one or more

Safe Condition – Barriers, Access Gates, Scaffold, Ladders, Signing and Guarding, Trench Support, etc

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 362

# Co-ordinate mechanical movement of power plant and apparatus

<b>UAN:</b>	<b>M/505/9306</b>
<b>Level:</b>	3
<b>Credit value:</b>	14
<b>GLH:</b>	75
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about co-ordinating and controlling work activities when using mechanical equipment to move power utility plant and / or apparatus. It involves detailed organisation and planning of the movement of loads and rigorous compliance with the relevant statutory regulations and organisational policies and procedures. It also involves monitoring and co-ordinating the progress of the lifting / moving operation and giving instruction to others to ensure a safe working environment is maintained.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the mechanical movement of power plant and apparatus
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the movement of power plant and apparatus 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire

<ul style="list-style-type: none"> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <p>1.6 explain the organisational procedures that need to be complied with when using mechanical lifting equipment (8.3).</p>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare for the mechanical movement of power plant and apparatus
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location using company documentation and work instructions
2.2 carry out a site specific risk assessment in accordance with health and safety regulations
2.3 select and wear Personal Protective Equipment (PPE) required for the job role
2.4 identify the key factors when lifting and moving power plant and apparatus
2.5 establish a method for lifting and moving according to organisational procedures for the following:
a) size
b) weight
c) stability
2.6 plan the activities required to mechanically move power plant and apparatus
2.7 inform those who will be directly and indirectly affected by the intended work plan
2.8 communicate to group members assigned tasks and responsibilities.

<b>Learning outcome</b>
The learner will:
3. be able to co-ordinate the mechanical movement of power plant and apparatus
<b>Assessment criteria</b>
The learner can:
3.1 implement control measures in line with company procedures to meet safe systems of work
3.2 monitor control measures when lifting and moving power plant and apparatus to ensure risks are minimised
3.3 check the load is located in accordance with the work plan
3.4 resolve problems within the limits of own job role responsibility
3.5 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
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The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 362 Co-ordinate mechanical movement of power plant and apparatus

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **all** of the following:

- **one** occasion for the co-ordination of mechanical equipment e.g. tirlfors, hand winches, drum jacks
- **one** occasion for the co-ordination of powered lifting equipment e.g. winches, crane, lorry loader (HIAB)

### Guidance

2.4 factors to be considered:

- size
- weight
- stability
- lifting points
- route to be taken
- weather
- traffic
- pedestrian
- barriers
- fencing
- overhead cables
- obstructions



## Unit 363

## High voltage switching operations

<b>UAN:</b>	<b>F/505/9309</b>
<b>Level:</b>	3
<b>Credit value:</b>	11
<b>GLH:</b>	105
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out high voltage switching operations in a power utilities engineering environment. It includes the rigorous application of processes and procedures to ensure that switching operations are carried out safely and meet the operational standards set by the organisation. It also involves detailed planning, recording and communication of switching operations in line with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for high voltage switching operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning high voltage switching operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |   |
|-----|---|
| 1.6 | explain the organisational procedures that need to be complied with when carrying out high voltage switching operations |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.                    |

<b>Learning outcome</b>
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The learner will:
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| 2. | be able to plan and prepare to carry out high voltage switching operations |
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<b>Assessment criteria</b>
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The learner can:
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|-----|--|
| 2.1 | identify the work location using organisational documentation and work instructions                |
| 2.2 | apply organisational work documentation to identify the operational requirements                   |
| 2.3 | plan the activities required to carry out high voltage switching operations                        |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations         |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role                      |
| 2.6 | select the appropriate tools and equipment required to carry out high voltage switching operations |
| 2.7 | inform those who will be directly and indirectly affected by the intended work plan.               |

<b>Learning outcome</b>
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The learner will:
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- |    |  |
|----|--|
| 3. | be able to carry out high voltage switching operations |
|----|--|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 3.1 | inspect the apparatus on which switching operations are to be conducted in accordance with organisational procedures |
| 3.2 | confirm the system is safe to be operated on in accordance with organisational procedures                            |
| 3.3 | carry out high voltage switching operations in accordance with organisational procedures                             |
| 3.4 | confirm the completed switching operation has achieved the operational objective                                     |
| 3.5 | record the high voltage switching operation in accordance with organisational procedures                             |
| 3.6 | resolve problems within the limits of own job role responsibility  |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                                    |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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# Unit 363      High voltage switching operations

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out high voltage switching operations on **three** separate occasions

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – confined spaces, rain, wind, lightning

## Unit 364

## Install overhead line plant and equipment

<b>UAN:</b>	<b>F/505/9276</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	98
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about installing overhead line plant and apparatus in an electrical power engineering environment. It involves the planning and organisation of resources and following set operational procedures to ensure the system is safe to work on before undertaking installation activities. It also involves using and complying with technical design specifications to ensure the completed installation meets with technical and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the installation of overhead line plant and equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the installation of overhead line plant and equipment 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when working on overhead line networks |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.       |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |  |
|----|--|
| 2. | be able to plan and prepare to install overhead line plant and equipment |
|----|--|

<b>Assessment criteria</b>
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The learner can:
------------------

- |     |  |
|-----|--|
| 2.1 | identify the work location using organisational documentation and work instructions                  |
| 2.2 | apply organisational work documentation to identify the work activity                                |
| 2.3 | plan the activities required for the installation of overhead line plant and equipment               |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations           |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role                        |
| 2.6 | identify the power equipment to be installed in line with organisational procedures                  |
| 2.7 | select the appropriate tools and equipment required to install the overhead line plant and equipment |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                 |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |  |
|----|--|
| 3. | be able to carry out the installation of overhead line plant and equipment |
|----|--|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |   |
|-----|---|
| 3.1 | confirm the system is safe to work on in accordance with organisational procedures                      |
| 3.2 | implement the work plan in line with organisational procedures to meet safe control system requirements |
| 3.3 | carry out the installation work in line with work plan and organisational procedures                    |
| 3.4 | confirm the finished work meets organisational requirements and quality standards                       |
| 3.5 | record the results of the work implemented in accordance with organisational procedures                 |
| 3.6 | resolve problems within the limits of own job role responsibility                                       |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                       |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
------------------

- |  |
|--|
| 4.1 store tools and equipment on completion of work activity |
| 4.2 dispose of waste materials and hazardous substances      |
| 4.3 check the safe condition of the work area.               |

# Unit 364      Install overhead line plant and equipment

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out installation work within a team on at least **two** different occasions.

Carried out installation of at least **two** different types of the plant listed -

**Transmission Range:** Conductors, insulators, steelwork fittings, tower furniture, power plant / apparatus

**Distribution Range:** ABSD, Auto recloser, HV fuses, Cable termination, Sectionaliser.

One of the two in the distribution range must be to have carried out the wiring configuration of a three phase pole mounted transformer on at least **one** occasion.

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors supported by the structure
- Environmental conditions – rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge



## Unit 365

# Dismantle overhead line plant and equipment

<b>UAN:</b>	<b>A/505/9311</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	98
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the dismantlement of overhead line plant and apparatus in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to ensure the system is safe to work on and the identification and control of hazards during work activities. It also involves working in a controlled and methodical manner and inspection of the completed dismantlement to ensure it meets with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements to dismantle overhead line plant and equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line power equipment 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to dismantle overhead line plant and equipment 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when working on overhead line networks</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
---

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare to dismantle overhead line plant and equipment</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the work location using organisational documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the work activity</p> <p>2.3 plan the activities required to dismantle overhead line plant and equipment</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear Personal Protective Equipment (PPE) required for the job role</p> <p>2.6 identify the overhead line plant and equipment to be dismantled in line with organisational procedures</p> <p>2.7 select the appropriate tools and equipment required to dismantle the overhead line plant and equipment</p> <p>2.8 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. be able to dismantle overhead line plant and equipment</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 confirm the system is safe to work on in accordance with organisational procedures</p> <p>3.2 implement the work plan in line with organisational procedures to meet safe control system requirements</p> <p>3.3 dismantle overhead line plant and equipment in line with work plan and organisational procedures</p> <p>3.4 confirm the finished work meets organisational requirements and quality standards</p> <p>3.5 record the results of the work in accordance with organisational procedures</p> <p>3.6 resolve problems within the limits of own job role responsibility</p> <p>3.7 report problems outside the limits of own responsibility to designated personnel.</p>

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 365                    Dismantle overhead line plant and equipment

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out dismantlement work within a team on at least **two** different occasions.

Carried out dismantlement of at least **two** different types of the plant listed -

Conductors, insulators, steelwork fittings, pole / tower furniture, power plant / apparatus

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors supported by the structure
- Environmental conditions – rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 366

## Live low voltage overhead lines connections

<b>UAN:</b>	<b>F/505/9312</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out live electrical connections on low voltage overhead line networks. It involves the rigorous application of organisational processes and procedures and the identification and control of hazards in the work area. It also involves the planning and organisation of resources to support the activity, the use of electrical testing equipment and the inspection of the completed work to ensure it meets with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for work on live low voltage overhead lines
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on live low voltage overhead lines 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning for work on live low voltage overhead lines 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |   |
|-----|---|
| 1.6 | explain the organisational procedures that need to be complied with when working on live low voltage overhead lines |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.                |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |   |
|----|---|
| 2. | be able to plan and prepare for work on live low voltage overhead lines |
|----|---|

<b>Assessment criteria</b>
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The learner can:
------------------

- |     |  |
|-----|--|
| 2.1 | identify the work location using organisational documentation and work instructions            |
| 2.2 | apply organisational work documentation to identify the work activity                          |
| 2.3 | plan the activities required for work on live low voltage overhead lines                       |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations     |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role                  |
| 2.6 | select the appropriate tools and equipment required to work on live low voltage overhead lines |
| 2.7 | inform those who will be directly and indirectly affected by the intended work plan.           |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |   |
|----|---|
| 3. | be able to carry out live low voltage overhead lines connections in line with work plan and organisational procedures |
|----|---|

<b>Assessment criteria</b>
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The learner can:
------------------

- |     |   |
|-----|---|
| 3.1 | confirm the system is safe to work on in accordance with organisational procedures including: <ul style="list-style-type: none"> <li>a) identification of circuit isolation points</li> <li>b) person in attendance</li> <li>c) rescue equipment</li> </ul> |
| 3.2 | implement the work plan in line with organisational procedures to meet safe control system requirements   |
| 3.3 | carry out live low voltage overhead line connections in line with work plan and organisational procedures   |
| 3.4 | confirm the finished work meets organisational requirements and quality standards   |
| 3.5 | record the results of the work implemented in accordance with organisational procedures   |
| 3.6 | resolve problems within the limits of own job role responsibility   |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.   |

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials 4.3 check the safe condition of the work area.

# Unit 366      Live low voltage overhead lines connections

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out live low voltage overhead line connections within a team on at least **three** different occasions including:

1. A minimum of **two** of the following configurations:

Aerial bundled mains network, Open wire mains network, Service connections, under eaves wiring. Example = 2 x Aerial bundled mains network and 1 x Service connections

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors to be worked on
- Environmental conditions – rain, wind, lightning
- Pole top rescue method



## Unit 367

## Jointing of overhead line conductors

<b>UAN:</b>	<b>J/505/9313</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the jointing of overhead line conductors in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to ensure the system is safe to work on and undertaking the jointing of conductors in a methodical manner following defined processes. It also involves using and complying with technical design specifications to ensure the completed jointing installation meets with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the jointing of overhead line conductors
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line power equipment 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the jointing of overhead line conductors 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when working on overhead line networks</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
---

<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare to carry out the jointing of overhead line conductors
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location using organisational documentation and work instructions
2.2 apply organisational work documentation to identify the work activity
2.3 plan the activities required for jointing of overhead line conductors
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear Personal Protective Equipment (PPE) required for the job role
2.6 identify the conductors to be jointed in line with organisational procedures
2.7 select the appropriate tools and equipment required to carry out the jointing of overhead line conductors
2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to carry out the jointing of overhead line conductors
<b>Assessment criteria</b>
The learner can:
3.1 confirm the system is safe to work on in accordance with organisational procedures
3.2 implement the work plan in line with organisational procedures to meet safe control system requirements
3.3 carry out the jointing of overhead line conductors in line with work plan and organisational procedures
3.4 confirm the finished work meets organisational requirements and quality standards
3.5 record the results of the work implemented in accordance with organisational procedures
3.6 resolve problems within the limits of own job role responsibility
3.7 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation.
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<b>Assessment criteria</b>
----------------------------

The learner can:
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- |  |
|--|
| 4.1 store tools and equipment on completion of work activity |
| 4.2 dispose of waste materials and hazardous substances      |
| 4.3 check the safe condition of the work area.               |

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have co-ordinated and carried out the jointing of overhead line conductors, including:

- The preparation and jointing of **two** tension joints from the following :  
mid span, compressed ends, repair sleeves, helical fittings, termination clamps)
- On **two** different Overhead Line conductors  
(e.g. ACSR, AAAC, ACAR, GZTACSR)

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors supported by the structure
- Environmental conditions – rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 368

## Install overhead line conductors

<b>UAN:</b>	<b>R/505/9315</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the installation of overhead line conductors in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to ensure the network is safe to work on and the identification and control of hazards in the work area. It involves the use of a range of tools and equipment to carry out the installation of conductors and the use of technical design specifications to ensure the completed conductor installation meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the installation of overhead line conductors
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line power equipment 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the installation of overhead line conductors 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire

	b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses
1.6	explain the organisational procedures that need to be complied with when working on overhead line networks
1.7	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare to install overhead line conductors
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using organisational documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for the installation of overhead line conductors
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear Personal Protective Equipment (PPE) required for the job role
2.6	identify and check the conductors to be installed in line with organisational procedures
2.7	select the appropriate tools and equipment required to install overhead line conductors
2.8	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to carry out the installation of overhead line conductors
<b>Assessment criteria</b>	
The learner can:	
3.1	confirm the system is safe to work on in accordance with organisational procedures
3.2	implement the work plan in line with organisational procedures to meet safe control system requirements
3.3	carry out the conductor installation in line with work plan and organisational procedures
3.4	confirm the finished work meets organisational requirements and quality standards
3.5	record the results of the work implemented in accordance with organisational procedures
3.6	resolve problems within the limits of own job role responsibility
3.7	report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

- 4.1 store tools and equipment on completion of work activity
- 4.2 dispose of waste materials and hazardous substances
- 4.3 check the safe condition of the work area.

# Unit 368      Install overhead line conductors

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the installation, tensioning and termination of overhead line conductors on **two** separate occasions, including:

- **two** different overhead line conductors (e.g. ACSR, AAAC, ACAR, GZTACSR)
- Installed **two** different types of tension fittings (e.g. mid span, compressed ends, repair sleeves, helical fittings, termination clamps) termination fittings, compressed anchor ends, wedge clamps, jumper ends

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors supported by the structure
- Environmental conditions – rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge



<b>UAN:</b>	<b>J/505/9277</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about maintaining overhead line plant and equipment in an electrical power engineering environment. It involves the rigorous application of set processes and procedures to ensure the system is safe to work on and the identification and control of hazards in the work area. It also involves the planning and organisation of resources to carry out maintenance activities and testing operations to ensure the completed maintenance work meets with technical specifications and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the maintenance of overhead line plant and equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line power equipment 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the maintenance of overhead line plant and equipment 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire

	<ul style="list-style-type: none"> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul>
1.6	explain the organisational procedures that need to be complied with when working on overhead line networks
1.7	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare to maintain overhead line plant and equipment
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using organisational documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for the maintenance of overhead line plant and equipment
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear Personal Protective Equipment (PPE) required for the job role
2.6	identify the plant or equipment to be maintained in line with organisational procedures
2.7	select the appropriate tools and equipment required to maintain the overhead line plant and equipment
2.8	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to carry out the maintenance of overhead line plant and equipment
<b>Assessment criteria</b>	
The learner can:	
3.1	confirm the system is safe to work on in accordance with organisational procedures
3.2	implement the work plan in line with organisational procedures to meet safe control system requirements
3.3	carry out the maintenance work in line with work plan and organisational procedures
3.4	confirm the finished work meets organisational requirements and quality standards
3.5	record the results of the work implemented in accordance with organisational procedures
3.6	resolve problems within the limits of own job role responsibility
3.7	report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 369      Maintain overhead plant and equipment

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out maintenance work within a team on at least **two** different occasions.

Carried out maintenance of at least **two** different types of the plant listed –

**Transmission Range:** Conductors, insulators, fittings, tower furniture, spacers

**Distribution Range:** ABSD, Auto recloser, HV fuses, Cable termination, Sectionaliser

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Stability and condition of structure to be accessed
- Condition of the conductors supported by the structure
- Environmental conditions – rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 370

## Inspection of overhead line routes

<b>UAN:</b>	<b>Y/505/9316</b>
<b>Level:</b>	3
<b>Credit value:</b>	6
<b>GLH:</b>	34
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the inspection of overhead line routes in an electrical power engineering environment. It involves the visual examination of conductors, conductor supports and the environment in which they are situated. It involves the systematic planning and organisation of the routes to be inspected and the use of technical specifications to ensure the overhead line routes inspected meet with design specifications. It also involves the interpretation and recording of inspection results to determine future maintenance activities.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the inspection of overhead line routes
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to the inspection of overhead line routes 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning for the inspection of overhead line routes 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others

<ul style="list-style-type: none"> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <p>1.6 explain the organisational procedures that need to be complied with when carrying out the inspection of overhead line routes including those for lone working.</p>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare for the inspection of overhead line routes
<b>Assessment criteria</b>
The learner can:
2.1 identify the overhead line route to be inspected using organisational documentation and work instructions
2.2 plan the activities required for the inspection of the overhead line routes
2.3 carry out a site specific risk assessment in accordance with health and safety regulations
2.4 select and wear Personal Protective Equipment (PPE) required for the job role
2.5 select the appropriate tools and equipment required to carry out the inspection of overhead line routes
2.6 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to carry out the inspection of overhead line routes in line with the work plan and organisational procedures
<b>Assessment criteria</b>
The learner can:
3.1 implement the work plan in line with organisational procedures to meet safe control system requirements
3.2 carry out the inspection of overhead line routes in line with the work plan and organisational procedures
3.3 interpret and record the results of the inspection in line with organisational procedures
3.4 resolve problems within the limits of own job role responsibility
3.5 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will:
4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can:
4.1 store tools and equipment on completion of work activity
4.2 dispose of waste materials and hazardous substances

## **Unit 370            Inspection of overhead line routes**

### Supporting information

#### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the inspection of overhead line routes on **two** separate occasions including **two** different conductor types and **two** different voltages

#### **Guidance**

2.4 a site specific risk assessment should take into consideration:

- Lone Working Arrangements

## Unit 371

## Low voltage distribution underground cable jointing

<b>UAN:</b>	<b>J/505/9280</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the jointing of low voltage underground cables in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to work safely on underground cable systems and the identification and control of hazards. It also involves using and complying with technical design specifications to ensure the completed jointing operation meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for low voltage distribution underground cable jointing
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on low voltage distribution underground cables 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for work related problems 1.4 explain the hazards of working on low voltage underground cables and the control measures used to control them 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 explain the the hazards of working in and around excavations and the measures used to control them



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|---|
| <ul style="list-style-type: none"> <li>1.7 describe organisational procedures for accidents, incidents and emergencies to include: <ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> </li> <li>1.8 explain the organisational procedures that need to be complied with when carrying out the jointing of low voltage underground cables.</li> </ul> |
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<b>Learning outcome</b>
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The learner will:
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| <ul style="list-style-type: none"> <li>2. be able to plan and prepare resources for low voltage distribution cable jointing</li> </ul> |
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<b>Assessment criteria</b>
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The learner can:
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| <ul style="list-style-type: none"> <li>2.1 identify the work location using company documentation and work instructions</li> <li>2.2 apply organisational work documentation to identify the work activity</li> <li>2.3 plan the activities required for work on low voltage underground cables</li> <li>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</li> <li>2.5 select and wear personal protective equipment (PPE) required for the job role</li> <li>2.6 select and carry out pre use checks on tools and equipment required for work on low voltage underground cables</li> <li>2.7 carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures</li> <li>2.8 inform those who will be directly and indirectly affected by the intended work plan.</li> </ul> |
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<b>Learning outcome</b>
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The learner will:
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| <ul style="list-style-type: none"> <li>3. be able to carry out low voltage underground cable jointing</li> </ul> |
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<b>Assessment criteria</b>
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The learner can:
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|---|
| <ul style="list-style-type: none"> <li>3.1 implement control measures in line with organisational procedures to meet safe control system requirements</li> <li>3.2 carry out testing operations on low voltage underground cables in accordance with organisational procedures</li> <li>3.3 carry out low voltage jointing operations in line with work plan and organisational procedures</li> <li>3.4 monitor control measures to ensure risks are minimised</li> <li>3.5 confirm the finished work meets organisational requirements and quality standards</li> <li>3.6 record the results of the work implemented in accordance with organisational procedures</li> <li>3.7 resolve problems within the limits of own job responsibility</li> </ul> |
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3.8 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

- 4.1 store tools and test equipment on completion of work activity
- 4.2 dispose of waste materials and hazardous substances
- 4.3 check the safe condition of the work area.

# Unit 371                      Low voltage distribution underground cable jointing

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the jointing of low voltage underground cables, including any **two** of the following low voltage service cable joints:

- service to polymeric main
- service to paper main
- service transition straight

And also any **two** of the following low voltage mains cable joints:

- polymeric branch
- transition straight
- transition branch
- link box
- LV termination

### Guidance

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include - identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 372

## Low voltage consac underground cable jointing

<b>UAN:</b>	<b>D/505/9317</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the jointing of low voltage consac underground cables in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to work safely on underground cable systems and the identification and control of hazards. It also involves using and complying with technical design specifications to ensure the completed jointing operation meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for low voltage consac underground cable jointing
<b>Assessment criteria</b>
1.1 describe the main principles of health and safety legislation and regulations relating to work on low voltage consac underground cables
1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements
1.3 explain the limitations of own job responsibility and reporting procedures for work related problems
1.4 explain the hazards of working on low voltage consac underground cables and the control measures used to control them
1.5 explain what materials and substances are hazardous to health in relation to job role
1.6 explain the hazards of working in and around excavations and the measures used to control them
1.7 describe organisational procedures for accidents, incidents and emergencies to include:

<ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <p>1.8 explain the organisational procedures that need to be complied with when carrying out the jointing of low voltage consac underground cables.</p>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare for low voltage consac underground cable jointing
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location using company documentation and work instructions
2.2 apply organisational work documentation to identify the work activity
2.3 plan the activities required for low voltage consac underground cable jointing
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear personal protective equipment (PPE) required for the job role
2.6 select and carry out pre use checks on tools and equipment required for work on low voltage consac underground cables
2.7 carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures
2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to carry out low voltage consac underground cable jointing
<b>Assessment criteria</b>
The learner can:
3.1 implement control measures in line with organisational procedures to meet safe control systems
3.2 carry out testing operations on low voltage consac underground cables as required
3.3 carry out low voltage consac jointing operations in line with work plan and organisational procedures
3.4 monitor control measures to ensure risks are minimised
3.5 confirm the finished work meets organisational requirements and quality standards
3.6 record the results of the work implemented in accordance with organisational procedures
3.7 resolve problems within the limits of own job responsibility
3.8 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 372                      Low voltage consac underground cable jointing

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **three** different occasions you carried out **two** of the following:

- multi service
- mains transition straight
- mains transition branch
- end termination

### Guidance

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include - identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 373

# High voltage distribution underground cable jointing

<b>UAN:</b>	<b>L/505/9281</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the jointing of high voltage underground cables in an electrical power engineering environment. It involves following set procedures and processes to ensure the underground cable network is safe to work on and the identification and control of hazards. It also involves using and complying with technical design specifications to ensure the completed jointing operation meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for high voltage distribution underground cable jointing
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on high voltage distribution underground cables 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of working on high voltage underground cables and the control measures used to control them 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 explain the hazards of working in and around excavations and the measures used to control them



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|-----|---|
| 1.7 | describe the organisational procedures for accidents, incidents and emergencies to include: <ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> |
| 1.8 | explain the organisational procedures that need to be complied with when carrying out the jointing of high voltage underground cables   |
| 1.9 | explain the processes and procedures that need to be complied with when receiving a safety document.  |

<b>Learning outcome</b>
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The learner will:
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| 2. be able to plan and prepare for high voltage distribution underground cable jointing |
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<b>Assessment criteria</b>
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The learner can:
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|-----|---|
| 2.1 | identify the work location using company documentation and work instructions  |
| 2.2 | apply organisational work documentation to identify the work activity   |
| 2.3 | plan the activities required for work on high voltage distribution underground cables                                 |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                            |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 | select and carry out pre use checks on tools and equipment required for work on high voltage underground cables       |
| 2.7 | carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                                  |

<b>Learning outcome</b>
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The learner will:
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| 3. be able to carry out high voltage underground cable jointing |
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<b>Assessment criteria</b>
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The learner can:
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|-----|---|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements  |
| 3.2 | carry out testing operations on low voltage underground cables in accordance with organisational procedures |
| 3.3 | carry out high voltage jointing operations in line with work plan and organisational procedures             |
| 3.4 | monitor control measures to ensure risks are minimised  |
| 3.5 | confirm the finished work meets organisational requirements and quality standards                           |
| 3.6 | record the results of the work implemented in accordance with organisational procedures                     |

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| 3.7 resolve problems within the limits of own job responsibility                      |
| 3.8 report problems outside the limits of own responsibility to designated personnel. |

<b>Learning outcome</b>
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The learner will:
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| 4. be able to leave the work area in a safe condition according to required regulation and legislation |
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<b>Assessment criteria</b>
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The learner can:
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| 4.1 store tools and equipment on completion of work activity |
| 4.2 dispose of waste materials and hazardous substances      |
| 4.3 check the safe condition of the work area.               |

# Unit 373 High voltage distribution underground cable jointing

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **all** of the following:

- **one** occasion for the jointing of **both** termination and straight joints on polymeric cables
- **one** occasion for the jointing of paper insulated cables

### Guidance

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 374

# High voltage polymeric transmission cable jointing

<b>UAN:</b>	<b>H/505/9318</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the jointing of high voltage underground cables in an electrical power engineering environment. It involves following set procedures and processes to ensure the underground cable network is safe to work on and the identification and control of hazards. It also involves using and complying with technical design specifications to ensure the completed jointing operation meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: <ol style="list-style-type: none"><li>1. understand organisational procedures and legislative requirements for high voltage polymeric transmission cable jointing</li></ol>
<b>Assessment criteria</b>
The learner can: <ol style="list-style-type: none"><li>1.1 describe the main principles of health and safety legislation and regulations relating to work on high voltage polymeric transmission cables</li><li>1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements</li><li>1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems</li><li>1.4 explain the hazards of working on high voltage polymeric transmission cables and the control measures used to control them</li><li>1.5 explain what materials and substances are hazardous to health in relation to job role</li><li>1.6 explain the hazards of working in and around excavations and the measures used to control them</li></ol>

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|-----|---|
| 1.7 | describe the organisational procedures for accidents, incidents and emergencies to include: <ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> |
| 1.8 | explain the organisational procedures that need to be complied with when carrying out high voltage polymeric transmission cable jointing  |
| 1.9 | explain the processes and procedures that need to be complied with when receiving a safety document.  |

<b>Learning outcome</b>
The learner will: <ul style="list-style-type: none"> <li>2. be able to plan and prepare for high voltage polymeric transmission cable jointing</li> </ul>
<b>Assessment criteria</b>
The learner can: <ul style="list-style-type: none"> <li>2.1 identify the work location using company documentation and work instructions</li> <li>2.2 apply organisational work documentation to identify the work activity</li> <li>2.3 plan the activities required for work on high voltage polymeric transmission cables</li> <li>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</li> <li>2.5 select and wear personal protective equipment (PPE) required for the job role</li> <li>2.6 select and carry out pre use checks on tools and equipment required for work on high voltage polymeric transmission cables</li> <li>2.7 carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures</li> <li>2.8 inform those who will be directly and indirectly affected by the intended work plan.</li> </ul>

<b>Learning outcome</b>
The learner will: <ul style="list-style-type: none"> <li>3. be able to carry out high voltage polymeric transmission cable jointing</li> </ul>
<b>Assessment criteria</b>
The learner can: <ul style="list-style-type: none"> <li>3.1 implement control measures in line with organisational procedures to meet safe control system requirements</li> <li>3.2 carry out testing operations on high voltage underground cables in accordance with organisational procedures</li> <li>3.3 carry out high voltage jointing operations in line with work plan and organisational procedures</li> <li>3.4 monitor control measures to ensure risks are minimised</li> <li>3.5 confirm the finished work meets organisational requirements and quality standards</li> </ul>

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|-----|---|
| 3.6 | record the results of the work implemented in accordance with organisational procedures |
| 3.7 | resolve problems within the limits of own job responsibility                            |
| 3.8 | report problems outside the limits of own responsibility to designated personnel.       |

<b>Learning outcome</b>
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The learner will:
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|----|---|
| 4. | be able to leave the work area in a safe condition according to required regulation and legislation |
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<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 4.1 | store tools and equipment on completion of work activity |
| 4.2 | dispose of waste materials and hazardous substances      |
| 4.3 | check the safe condition of the work area.               |

# Unit 374 High voltage polymeric transmission cable jointing

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that the have carried out the jointing of high voltage polymeric transmission underground cables on at least **two** different occasions you carried out **all** of the following:

#### 1. Terminations:

Complete **one** joint from each area of the following XLPE cable terminations:

- a) 3c termination (indoor or outdoor)
- b) 3 x single core termination (indoor or outdoor)

#### 2. Joints:

Complete **two** of the following XLPE cable joints:

- a) Single core straight joint
- b) Three core straight joint
- c) Bifurcating joint
- d) Stop joint

### Guidance

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 375

## High voltage pressurised transmission cable jointing

<b>UAN:</b>	<b>H/505/9321</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out the jointing of high voltage polymeric transmission cables in an electrical power engineering environment. It involves the rigorous application of set procedures and processes to ensure the transmission cable network is safe to work on and the identification and control of hazards. It also involves using and complying with technical design specifications to ensure the completed high voltage jointing operation meets with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for high voltage pressurised transmission cable jointing
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on high voltage pressurised transmission cables 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of working on high voltage pressurised transmission cables and the control measures used to control them 1.5 explain what materials and substances are hazardous to health in relation to job role



1.6	explain the hazards of working in and around excavations and the measures used to control them
1.7	describe the organisational procedures for accidents, incidents and emergencies to include: <ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul>
1.8	explain the organisational procedures that need to be complied with when carrying out the jointing of high voltage pressurised transmission cable jointing
1.9	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare for high voltage pressurised transmission cable jointing
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using company documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for work on high voltage pressurised transmission cables
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear personal protective equipment (PPE) required for the job role
2.6	select and carry out pre use checks on tools and equipment required for work on high voltage pressurised transmission cables
2.7	carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures
2.8	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to carry out high voltage pressurised transmission cable jointing
<b>Assessment criteria</b>	
The learner can:	
3.1	implement control measures in line with organisational procedures to meet safe control system requirements
3.2	carry out testing operations on high voltage underground cables in accordance with organisational procedures
3.3	carry out high voltage jointing operations in line with work plan and organisational procedures

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|-----|---|
| 3.4 | monitor control measures to ensure risks are minimised                                  |
| 3.5 | confirm the finished work meets organisational requirements and quality standards       |
| 3.6 | record the results of the work implemented in accordance with organisational procedures |
| 3.7 | resolve problems within the limits of own job responsibility                            |
| 3.8 | report problems outside the limits of own responsibility to designated personnel.       |

<b>Learning outcome</b>
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The learner will:
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| 4. be able to leave the work area in a safe condition according to required regulation and legislation |
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<b>Assessment criteria</b>
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The learner can:
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|-----|--|
| 4.1 | store tools and equipment on completion of work activity |
| 4.2 | dispose of waste materials and hazardous substances      |
| 4.3 | check the safe condition of the work area.               |

## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that the have carried out the jointing of high voltage pressurised transmission underground cables on at least **two** different occasions:

#### **Pressurised Cables:**

Complete **two** of the following joint types:

- a) **All** Pressurised system straight or through joint
- b) Pressurised to XLPE stop joint
- c) Pressurised system repair sleeve
- d) Pressurised system joint repair

### **Guidance**

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 376

## Dismantle substation plant and apparatus

<b>UAN:</b>	<b>H/505/9321</b>
<b>Level:</b>	3
<b>Credit value:</b>	17
<b>GLH:</b>	140
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the dismantlement of substation plant and apparatus in an electrical power engineering environment. It involves following set operational procedures to ensure the system is safe to work on and undertaking dismantlement activities in a controlled and methodical manner. It also involves the planning and organisation of work activities and the identification and control of hazards to ensure the dismantlement work is carried out safely and meets organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for dismantling substation plant and apparatus
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to dismantling substation plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain what materials and substances are hazardous to health in relation to job role 1.5 explain the hazards to be considered when planning to dismantle substation plant and apparatus 1.6 describe the organisational procedures for accidents, incidents and emergencies to include:

	<ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul>
1.7	explain the organisational procedures that need to be complied with when dismantling plant and substation apparatus
1.8	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare for dismantling plant and substation apparatus
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using organisational documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for dismantling substation plant and apparatus
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear Personal Protective Equipment (PPE) required for the job role
2.6	identify the apparatus to be dismantled in line with organisational procedures
2.7	select suitable tools and equipment required to dismantle the substation apparatus
2.8	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to dismantle substation plant and apparatus
<b>Assessment criteria</b>	
The learner can:	
3.1	confirm the system is safe to work on in accordance with organisational procedures
3.2	implement control measures in line with company procedures to meet safe control systems
3.3	dismantle plant and apparatus in line with work plan and organisational procedures
3.4	monitor control measures to ensure risks are minimised
3.5	confirm the finished work meets organisational requirements and quality standards
3.6	record the results of the work implemented in accordance with organisational procedures
3.7	provide information to update safety systems records
3.8	resolve problems within the limits of own job role responsibility

3.9 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

4.1 store tools and test equipment on completion of work activity

4.2 dispose of waste materials and hazardous substances

4.3 check the safe condition of the work area.

# Unit 376                    Dismantle substation plant and apparatus

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that over **three** different projects you have co-ordinated and dismantled **three** of the following items:

- 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

### Guidance

2.7 Select – to include inspection of condition

3.2 Control measures may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 377

## Maintain substation switchgear

<b>UAN:</b>	<b>R/505/9279</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by
<b>Aim:</b>	This unit is about carrying out maintenance operations on substation switchgear in an electrical power engineering environment. It involves following set processes and procedures to ensure the system is safe to work on and the identification and control of hazards in the work area. It also involves the planning and organisation of resources to carry out maintenance activities and testing operations to ensure the completed maintenance work meets with technical specifications and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for work on substation switchgear
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on substation plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to maintain substation switchgear 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire



	b) injury to self and others
	c) threat of terrorism
	d) hazardous occurrences and near misses
1.7	explain the organisational procedures that need to be complied with when maintaining substation switchgear
1.8	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare to maintain substation switchgear
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using organisational documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for the maintenance of substation switchgear
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear personal protective equipment (PPE) required for the job role
2.6	identify and carry out a pre work inspection of the switchgear to be maintained in line with organisational procedures
2.7	select suitable tools and equipment required to maintain the substation apparatus
2.8	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to maintain substation switchgear
<b>Assessment criteria</b>	
The learner can:	
3.1	confirm the system is safe to work on in accordance with organisational procedures
3.2	implement control measures in line with organisational procedures to meet safe control system requirements
3.3	maintain substation switchgear in line with work plan and organisational procedures
3.4	monitor control measures to ensure risks are minimised
3.5	confirm the finished work meets organisational requirements and quality standards
3.6	record the results of the work implemented in accordance with organisational procedures
3.7	resolve problems within the limits of own job role responsibility
3.8	report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 377                      Maintain substation switchgear

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the maintenance of **three** different types of switchgear from the following items:

- Oil filled circuit breakers
- Oil filled switchgear
- SF<sub>6</sub> switchgear
- Vacuum switchgear
- Air blast circuit breakers
- LV switchgear

### Guidance

2.7 Select tools – to include an inspection of condition e.g. insulation

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

3.2 Control measures may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 378

## Fault repair of substation plant and apparatus

<b>UAN:</b>	<b>M/505/9323</b>
<b>Level:</b>	3
<b>Credit value:</b>	18
<b>GLH:</b>	150
<b>Relationship to NOS:</b>	
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about fault repair of 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 organisation.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for carrying out the fault repair of substation plant and apparatus
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on substation plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when carrying out the fault repair of substation plant and apparatus 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when carrying out the fault repair of substation plant and apparatus</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare to carry out the fault repair of substation plant and apparatus</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the work location using organisational documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the work activity</p> <p>2.3 plan the activities required to carry out the repair work</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear Personal Protective Equipment (PPE) required for the job role</p> <p>2.6 inspect the apparatus to be repaired in line with organisational procedures</p> <p>2.7 select the appropriate tools and equipment required to carry out the repair work</p> <p>2.8 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. be able to carry out the fault repair of substation plant and apparatus</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 confirm the system is safe to work on in accordance with organisational procedures</p> <p>3.2 implement the work plan in line with organisational procedures to meet safe control system requirements</p> <p>3.3 carry out the repair work in line with work plan and organisational procedures</p> <p>3.4 confirm the finished work meets organisational requirements and quality standards</p> <p>3.5 record the results of the work implemented in accordance with organisational procedures</p> <p>3.6 resolve problems within the limits of own job role responsibility</p> <p>3.7 report problems outside the limits of own responsibility to designated personnel.</p>

<p><b>Learning outcome</b></p>
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The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence over at least **two** different occasions to show that you have:

1. Carried out the repair of substation plant and apparatus on at least **two** of the following:

- a) HV apparatus
- b) LV apparatus
- c) Transformer
- d) Switchgear
- e) Circuit breakers
- f) Neutral Earthing
- g) Resistors
- h) Isolators
- i) Interrupter heads
- j) Panel wiring
- k) TX dehydration
- l) Tap changers
- m) Compressors
- n) Ancillary equipment

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions

2.6 Select and check - to include inspection of tools and equipment

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 379

## Maintain compressed air systems

<b>UAN:</b>	<b>A/505/9325</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by
<b>Aim:</b>	This unit is about maintaining compressed air systems in an electrical power engineering environment. It involves following set processes and procedures to ensure the system is safe to work on and the identification and control of hazards in the work area. It also involves the planning and organisation of resources to carry out maintenance activities and testing operations to ensure the completed maintenance work meets with technical specifications and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the maintenance of compressed air systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on compressed air systems 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to maintain compressed air systems 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism



<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when maintaining compressed air systems</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare for the maintenance of compressed air systems
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location and compressed air system using company documentation and work instructions
2.2 apply company work documentation to identify the work activity
2.3 plan the activities required for maintaining compressed air systems
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear Personal Protective Equipment (PPE) required for the job role
2.6 identify and carry out a pre work inspection of the apparatus to be maintained in line with organisational procedures
2.7 inspect suitable tools and equipment for use in line with organisational procedures
2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to carry out the maintenance of compressed air systems
<b>Assessment criteria</b>
The learner can:
3.1 confirm the system is safe to work on in accordance with organisational procedures
3.2 implement control measures in line with company procedures to meet safe system requirements
3.3 maintain compressed air systems in line with work plan and organisational procedures
3.4 monitor control measures to ensure risks are minimised
3.5 confirm the finished work meets organisational requirements and quality standards
3.6 resolve problems within the limits of own job role responsibility
3.7 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and test equipment on completion of work activity
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4.2 check the safe condition of the work area.
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# Unit 379      Maintain compressed air systems

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out the maintenance of substation compressed air systems:

### Guidance

3.1 points to be considered

- receipt of a safety document
- points of isolation
- drain
- vent
- purge

## Unit 380

## Co-ordinate work activities on plant and apparatus

<b>UAN:</b>	<b>A/505/9275</b>
<b>Level:</b>	3
<b>Credit value:</b>	17
<b>GLH:</b>	105
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about co-ordinating the work activities of others when working in an electrical power engineering environment. It involves meticulous planning and organisation of the tasks required to complete work activities and the identification and control hazards in accordance with organisational processes and procedures. It also involves the communication of information to others and the monitoring and inspection of work carried out to ensure it meets with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for co-ordinating work activities on power plant and apparatus
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to co-ordinate work on power plant and apparatus 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others

	c) threat of terrorism
	d) hazardous occurrences and near misses
1.6	explain the range of Personal Protective Equipment (PPE) required for the job role
1.7	describe the organisational requirements for the safe and secure storage of tools, equipment and materials
1.8	explain the organisational procedures that need to be complied with when coordinating work on power plant and apparatus
1.9	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare to coordinate work activities on power plant and apparatus
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using company documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	carry out a site specific risk assessment in accordance with health and safety regulations
2.4	plan control measures to minimise risk to life, property and the environment
2.5	plan the activities required to coordinate the work on power plant and apparatus
2.6	select and wear Personal Protective Equipment (PPE) required for the job role
2.7	inform those who will be directly and indirectly affected by the intended work plan
2.8	communicate to group members assigned tasks and responsibilities.

<b>Learning outcome</b>	
The learner will:	
3.	be able to coordinate work activities on power plant and apparatus
<b>Assessment criteria</b>	
The learner can:	
3.1	implement the work plan in line with organisational procedures to meet safe control system requirements
3.2	monitor the progress of the work plan and control measures to ensure risks are minimised
3.3	instruct the working party to ensure the assigned work is conducted in accordance with the work plan and organisational procedures
3.4	confirm the finished work meets organisational requirements and quality standards
3.5	record the results of the work implemented in accordance with organisational procedures
3.6	resolve problems within the limits of own job role responsibility

3.7 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

4.1 store tools and equipment on completion of work activity

4.2 dispose of waste materials and hazardous substances

4.3 check the safe condition of the work area.

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have coordinated work activities on **two** different types of plant and apparatus on **two** different occasions:

- planning and assigning work activities
- monitoring and coordinating work activities
- restoring and reinstating the work location
- using and communicating data and information
- resolving problems effectively and efficiently

### Guidance

Examples could include the co-ordination of:

- Fitting – maintenance / installation activities on a circuit breaker, transformer, compressor etc
- Overhead Lines – maintenance / installation activities on a 3 phase transformer, air break switch, sectionaliser etc
- Jointing - maintenance / installation activities of HV cables, cable alterations, LV system works with more than one jointing team in attendance

## Unit 381

## Develop yourself in the work role

<b>UAN:</b>	<b>F/505/9343</b>
<b>Level:</b>	3
<b>Credit value:</b>	6
<b>GLH:</b>	29
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about playing an active role in reviewing and setting objectives to improve upon and maintain your personal performance. It involves the use of self-assessment methods to establish and agree, with line management, how to achieve your development objectives.

<b>Learning outcome</b>
The learner will: 1. understand the requirements for developing yourself in the work role
<b>Assessment criteria</b>
The learner can: 1.1 describe roles and responsibilities of employees and employers in relation to health and safety 1.2 describe regulations and safe working practices and procedures 1.3 identify training and development opportunities to support personal development plans and objectives 1.4 describe self-assessment processes and techniques 1.5 describe how to build personal development plans and set measurable objectives 1.6 explain the limitations of own job responsibility and reporting procedures for any work related problems.

<b>Learning outcome</b>
The learner will: 2. be able to develop themselves in the work role
<b>Assessment criteria</b>
The learner can: 2.1 evaluate own level of competence and identify areas where personal development is needed



- 2.2 gain line management approval for the period of time and resources needed to achieve objectives
- 2.3 create a personal development plan which includes SMART objectives
- 2.4 implement the personal development plan
- 2.5 evaluate progress against the SMART objectives set and decide on future personal development actions where required
- 2.6 seek feedback on how to maintain and improve levels of performance.

## **Unit 381                  Develop yourself in the work role**

### Supporting information

#### **Guidance**

You need to provide evidence to show that you have:

1. Played an active role in reviewing and developing yourself in the work role, whilst demonstrating that you understand the techniques and processes involved.
2. Actively sought feedback and guidance from sources such as: line management, personnel or training specialists, colleagues in your work team.
3. Participated in work role development activities by providing records of: courses, competence assessment, personal development plans, certificates.

## Unit 382

## Organise the use of resources for work on power networks

<b>UAN:</b>	<b>R/505/9282</b>
<b>Level:</b>	3
<b>Credit value:</b>	17
<b>GLH:</b>	105
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit has been designed to ensure level three candidates in an electrical power engineering environment are able to plan, organise and control resources for self and others.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements to organise the use of resources for work on power networks
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when coordinating the use of resources to be used for work on power networks 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when coordinating the use of resources for work on power networks.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare to organise the use of resources for work on power networks
<b>Assessment criteria</b>
The learner can: 2.1 identify the work to be undertaken using company documentation and work instructions 2.2 develop a work plan to use resources which will meet work requirements and comply with organisational safety procedures 2.3 identify the activities required to organise the use of resources for work on power networks 2.4 inform those who will be directly and indirectly affected by the intended work plan 2.5 communicate to group members assigned tasks and responsibilities.

<b>Learning outcome</b>
The learner will: 3. be able to organise the use of resources for work on power networks
<b>Assessment criteria</b>
The learner can: 3.1 implement the work plan in line with organisational procedures to meet safe control system requirements 3.2 organise the use of the resources for the work required using organisational procedures and systems 3.3 monitor the progress of the work plan to ensure risks are minimised and resources are being used effectively 3.4 confirm the completed work plan meets organisational requirements and safety standards 3.5 record the results of the use of resources in accordance with organisational procedures 3.6 provide information to update safety systems records 3.7 resolve problems within the limits of own job role responsibility 3.8 report problems outside the limits of own responsibility to designated personnel.

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that you have co-ordinated the use of resources on at least **two** different occasions for **all** of the following:

- a) People
- b) Materials
- c) Plant/Machinery
- d) Tools/Equipment

For example two resources on one occasion and two on another occasion.

### Guidance

2.4 factors to be considered:

- group size
- activities assigned
- safety procedures
- weather
- traffic
- pedestrians
- barriers
- fencing
- obstructions

## Unit 383

## Produce, communicate and record technical information for work on power networks

<b>UAN:</b>	<b>H/505/9285</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	90
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit has been designed to ensure that level three candidates in an electrical power engineering environment are able to produce written and diagrammatic technical information; communicate information to other parties; complete records relating to completed activities and performance.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for producing, communicating and recording technical information in relation to work on power networks.
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 describe the types of technical information used in relation to work on power networks. 1.4 describe the methods used to communicate technical information used in relation to work on power networks 1.5 describe the methods used to record technical information used in relation to work on power networks 1.6 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.7 explain the hazards to be considered for work on power networks 1.8 describe the organisational procedures for accidents, incidents and emergencies to include:

<ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <p>1.9 explain the processes and procedures that need to be complied with when receiving and issuing a safety document.</p>
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<b>Learning outcome</b>
The learner will:
2. be able to produce information for themselves and others to carry out work activities
<b>Assessment criteria</b>
The learner can:
2.1 produce written/electronic text information to allow work activities to be carried out
2.2 produce diagrammatic/pictorial information to allow work activities to be carried out.

<b>Learning outcome</b>
The learner will:
3. be able to communicate technical information to others to carry out work activities
<b>Assessment criteria</b>
The learner can:
3.1 communicate technical information to others clearly and effectively
3.2 confirm that information has been understood and provide clarification when further information is required.

<b>Learning outcome</b>
The learner will:
4. be able to record/report technical information on work activities completed by themselves and others
<b>Assessment criteria</b>
The learner can:
4.1 complete documentation to record work activities completed by themselves and others
4.2 record all completed documentation in accordance with company procedures
4.3 report inconsistencies or inaccuracies in information sources to the appropriate person in line with company procedures
4.4 Report problems outside limits of your own responsibility to designated personnel.

## Supporting information

### **Evidence requirements**

You need to provide evidence to show that you have produced, communicated and recorded technical information:

**Outcome 2.1** Evidence to include **three** of the following:

- a) Risk assessments b) Method statements c) Planning documentation
- d) Resource ordering documentation e) Safety documentation
- f) Reference table/chart g) Job instructions h) Test schedules

**Outcome 2.2** Evidence to include **three** of the following:

- a) Site plans/sketches b) Installation drawings c) Modification drawings,
- d) Repair drawings e) Connection/disconnection drawings
- f) Wiring/circuit diagrams g) Photographic information

**Outcome 3.1** Evidence to include **all** of the following:

- a) Verbal to one person b) Verbal to more than one person
- c) Written/electronic text d) Diagrammatic/pictorial

**Outcome 3.1** Evidence to include **three** of the following:

- a) Work instructions b) Safety documentation c) Updated plans/drawings
- d) Completed testing activities e) Reports



## Unit 384

## Low voltage substation switching operations

<b>UAN:</b>	<b>J/505/9344</b>
<b>Level:</b>	3
<b>Credit value:</b>	11
<b>GLH:</b>	105
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about low voltage switching operations on plant and apparatus in an electricity power utilities environment. It includes the processes and procedures to be followed to make sure that the completed switching operation meets the standards set by the organisation. It also involves the rigorous application of rules, regulations and work instructions to ensure that work is performed and completed safely without causing risk of injury to self and others.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for low voltage substation switching operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to low voltage substation switching operations 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning low voltage substation switching operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when carrying out low voltage substation switching operations</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare to carry out low voltage substation switching operations</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the work location using organisational documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the operational requirements</p> <p>2.3 plan the activities required to carry out low voltage substation switching operations</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear Personal Protective Equipment (PPE) required for the job role</p> <p>2.6 inspect the apparatus on which switching operations are to be conducted in accordance with organisational procedures</p> <p>2.7 select the appropriate tools and equipment required to carry out low voltage substation switching operations</p> <p>2.8 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. Be able to carry out low voltage substation switching operations</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 confirm the system is safe to be operated on in accordance with organisational procedures</p> <p>3.2 implement the work plan in line with organisational procedures to meet safe control system requirements</p> <p>3.3 carry out low voltage substation switching operations in accordance with organisational procedures</p> <p>3.4 confirm the finished work meets organisational requirements and quality standards</p> <p>3.5 record the results of the work implemented in accordance with organisational procedures</p> <p>3.6 provide information to update safety systems records</p> <p>3.7 resolve problems within the limits of own job role responsibility</p> <p>3.8 report problems outside the limits of own responsibility to designated personnel.</p>

<b>Learning outcome</b>
The learner will: 4. Be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 check the safe condition of the work area.

# Unit 384      Low voltage substation switching operations

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out low voltage switching operations on **two** separate occasions

Evidence to include **four** of the following switching operations performed on separate occasions on a live low voltage network

- a) Removal of mains LV fuses
- b) Insertion of mains LV fuses
- c) Connection of LV links
- d) Disconnection of LV links
- e) Opening LV Isolator
- f) Closing LV Isolator

### Guidance

Perform the switching operation using selected tools and equipment, in line with the work plan, risk assessment and Company procedures.

2.4 a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – confined spaces, rain, wind, lightning

2.7 Select - to include inspection of insulation and condition of live working tools and equipment

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 385

## Diagnostic testing and fault finding on power networks

<b>UAN:</b>	<b>R/505/9346</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about locating and diagnosing faults on plant and apparatus in an electrical power engineering environment. It involves the rigorous use and application of diagnostic tools and techniques to establish the root cause of a fault. It also involves making recommendations on what actions need to be taken to rectify the fault.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for carrying out diagnostic testing and fault finding on power networks
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when carrying out diagnostic testing and fault finding on power networks 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when carrying out diagnostic testing and fault finding on power networks |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.   |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 2. | be able to plan and prepare to carry out diagnostic testing and fault finding on power networks |
|----|---|

<b>Assessment criteria</b>
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The learner can:
------------------

- |     |   |
|-----|---|
| 2.1 | identify the work location using organisational documentation and work instructions                                     |
| 2.2 | apply organisational work documentation to identify the operational requirements  |
| 2.3 | plan the activities required to carry out diagnostic testing and fault finding on power networks                        |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                              |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role   |
| 2.6 | inspect the equipment to be repaired in line with organisational procedures   |
| 2.7 | select the appropriate tools and equipment required to carry out diagnostic testing and fault finding on power networks |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                                    |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |   |
|----|---|
| 3. | be able to carry out diagnostic testing and fault finding on power networks |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 3.1 | confirm the system is safe to work on in accordance with organisational procedures                         |
| 3.2 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.3 | carry out diagnostic operations in accordance with organisational procedures                               |
| 3.4 | identify the fault and recommend remedial actions  |
| 3.5 | record the results of the fault diagnosis operations in accordance with organisational procedures          |
| 3.6 | analyse and interpret the results of the diagnostic testing operations                                     |
| 3.7 | resolve problems within the limits of own job role responsibility  |
| 3.8 | report problems outside the limits of own responsibility to designated personnel.                          |

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 check the safe condition of the work area.

## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out diagnostic operations to determine faults, using appropriate diagnostic techniques and selected tools and equipment on at least **three** of the following:

- a) Switch gear
- b) Transformers
- c) LV Boards
- d) Tap-changers
- e) CT's and VT's
- f) Panel wiring

Evidence to include the use of **all** of the following diagnostic techniques:

- a) Visual examination
- b) Physical examination
- c) Electrical testing

### **Evidence requirements**

2.4. a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – adequate lighting, rain, wind, lightning

2.6 Select tools – to include an inspection: instrument condition, insulation

3.2 safe systems may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge



## Unit 386

## Protection testing on overcurrent and earth fault schemes

<b>UAN:</b>	<b>K/505/9367</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about protection testing on over-current and earth fault schemes 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.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for carrying protection testing on overcurrent and earth fault schemes
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of conducting phasing out protection testing on overcurrent and earth fault schemes and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |  |
|--|
| 1.6 explain the organisational procedures that need to be complied with when carrying out protection testing on overcurrent and earth fault schemes. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 2. be able to plan and prepare to carry out protection testing on overcurrent and earth fault schemes |
|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
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- |   |
|---|
| 2.1 identify the work location using company documentation and work instructions  |
| 2.2 apply organisational work documentation to identify the work activity   |
| 2.3 plan the activities required for conducting protection testing on overcurrent and earth fault schemes                             |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations  |
| 2.5 select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 select and carry out pre use checks on tools and equipment required for protection testing on overcurrent and earth fault schemes |
| 2.7 carry out pre work inspection of the cable/s to be worked on in accordance with organisational procedures                         |
| 2.8 inform those who will be directly and indirectly affected by the intended work plan.  |

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 3. be able to carry out protection testing on overcurrent and earth fault schemes |
|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |  |
|--|
| 3.1 implement control measures in line with organisational procedures to meet safe control system requirements       |
| 3.2 carry out protection testing on overcurrent and earth fault schemes in accordance with organisational procedures |
| 3.3 monitor control measures to ensure risks are minimised   |
| 3.4 confirm the finished operation meets organisational requirements and quality standards                           |
| 3.5 record the results of the operation in accordance with organisational procedures                                 |
| 3.6 resolve problems within the limits of own job responsibility   |
| 3.7 report problems outside the limits of own responsibility to designated personnel.                                |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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## Unit 386 Protection testing on overcurrent and earth fault schemes

### Supporting information

#### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you have carried out Company approved protection testing on **three** separate occasions using selected tools and equipment, in line with the work plan, risk assessment and Company policy and procedures.

Evidence to include **four** of the following protection tests:

- a) Timing test
- b) Over-current and earth fault relay testing
- c) Functionality testing
- d) Directional over-current and earth fault relay testing
- e) Over/under voltage testing

#### Guidance

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, person in attendance, condition of the apparatus to be worked on, environmental conditions – rain, wind, lightning

## Unit 387

# Pressure testing of high voltage distribution equipment

<b>UAN:</b>	<b>Y/505/9347</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about pressure testing of high voltage distribution equipment in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that tests are conducted and recorded in a manner that meets the quality assurance requirements and standards set by the organisation.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for carrying out pressure testing of high voltage distribution equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to testing operations on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of conducting pressure testing of high voltage distribution equipment and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |  |
|--|
| 1.6 explain the organisational procedures that need to be complied with when carrying out pressure testing of high voltage distribution equipment. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 2. be able to plan and prepare to carry out pressure testing of high voltage distribution equipment |
|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
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- |  |
|--|
| 2.1 identify the work location using company documentation and work instructions   |
| 2.2 apply organisational work documentation to identify the work activity  |
| 2.3 plan the activities required for conducting pressure testing of high voltage distribution equipment                          |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                                   |
| 2.5 select and wear personal protective equipment (PPE) required for the job role  |
| 2.6 select and carry out pre use checks on tools and equipment required for pressure testing high voltage distribution equipment |
| 2.7 carry out pre work inspection of the equipment to be tested in accordance with organisational procedures                     |
| 2.8 inform those who will be directly and indirectly affected by the intended work plan.   |

<b>Learning outcome</b>
-------------------------

The learner will:
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- |   |
|---|
| 3. be able to carry out pressure testing of high voltage distribution equipment |
|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
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- |  |
|--|
| 3.1 implement control measures in line with organisational procedures to meet safe control system requirements     |
| 3.2 carry out pressure testing of high voltage distribution equipment in accordance with organisational procedures |
| 3.3 monitor control measures to ensure risks are minimised   |
| 3.4 confirm the finished operation meets organisational requirements and quality standards                         |
| 3.5 record the results of the testing operation in accordance with organisational procedures                       |
| 3.6 resolve problems within the limits of own job responsibility   |
| 3.7 report problems outside the limits of own responsibility to designated personnel.                              |

<b>Learning outcome</b>
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The learner will:
-------------------

4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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## Unit 387

# Pressure testing of high voltage distribution equipment

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you have carried out pressure testing on **two** different systems in line with work plan, risk assessment and Company procedure. Evidence to include at least **two** of the following pressure tests:

- a) DC pressure testing
- b) AC pressure testing
- c) VLF testing
- d) Cable over-sheaf testing

### Guidance

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, person in attendance, condition of the apparatus to be worked on, environmental conditions – rain, wind, lightning



## Unit 388

# Install supervisory control and data acquisition (SCADA) systems

<b>UAN:</b>	<b>D/505/9348</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about installing Supervisory Control and Data Acquisition (SCADA) systems in an electrical power engineering environment. It involves completing installation activities in a rigorous and methodical manner and the following of processes and procedures to make sure that the finishes work meets the quality assurance and operating specifications set by the organisation.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for installing Supervisory Control and Data Acquisition (SCADA) systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of installing SCADA systems and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when installing SCADA systems    |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document. |

<b>Learning outcome</b>
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The learner will:
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- |    |  |
|----|--|
| 2. | be able to plan and prepare to carry out the installation of SCADA systems |
|----|--|

<b>Assessment criteria</b>
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The learner can:
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- |     |   |
|-----|---|
| 2.1 | identify the work location using company documentation and work instructions                                |
| 2.2 | apply organisational work documentation to identify the work activity                                       |
| 2.3 | plan the activities required for installing SCADA systems   |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                  |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role                               |
| 2.6 | select and carry out pre use checks on tools and equipment required for installing SCADA systems            |
| 2.7 | carry out pre work inspection of the equipment to be worked on in accordance with organisational procedures |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                        |

<b>Learning outcome</b>
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The learner will:
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- |    |                                  |
|----|----------------------------------|
| 3. | be able to install SCADA systems |
|----|----------------------------------|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.2 | install SCADA systems in accordance with organisational procedures   |
| 3.3 | monitor control measures to ensure risks are minimised   |
| 3.4 | confirm the finished operation meets organisational requirements and quality standards                     |
| 3.5 | record the results of the operation in accordance with organisational procedures                           |
| 3.6 | resolve problems within the limits of own job responsibility   |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                          |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
----------------------------

The learner can:
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- |  |
|--|
| 4.1 store tools and equipment on completion of work activity |
| 4.2 dispose of waste materials                               |
| 4.3 check the safe condition of the work area.               |

**Supporting information****Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you have carried out the installation of a SCADA system and associated RTU equipment on **two** occasions in line with the work plan, risk assessment and Company procedures

**Guidance**

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, person in attendance, condition of the apparatus to be worked on, environmental conditions – rain, wind, lightning

## Unit 389

# Install protective relays and metering equipment

<b>UAN:</b>	<b>Y/505/9350</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	<p>This unit is about installing protective relays and metering equipment in an electrical power engineering environment. It involves completing installation activities in a rigorous and methodical manner and the following of processes and procedures to make sure that the finishes work meets the quality assurance and operating specifications set by the organisation</p>

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for installing protective relays and metering equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of installing protective relays and metering equipment and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when installing protective relays and metering equipment |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.                         |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |   |
|----|---|
| 2. | be able to plan and prepare to install protective relays and metering equipment |
|----|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |   |
|-----|---|
| 2.1 | identify the work location using company documentation and work instructions  |
| 2.2 | apply organisational work documentation to identify the work activity   |
| 2.3 | plan the activities required to install protective relays and metering equipment  |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                              |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 | select and carry out pre use checks on tools and equipment required to install protective relays and metering equipment |
| 2.7 | carry out pre work inspection of the equipment to be worked on in accordance with organisational procedures             |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                                    |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 3. | be able to install protective relays and metering equipment |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.2 | install protective relays and metering equipment in accordance with organisational procedures              |
| 3.3 | monitor control measures to ensure risks are minimised   |
| 3.4 | confirm the finished operation meets organisational requirements and quality standards                     |
| 3.5 | record the results of the operation in accordance with organisational procedures                           |
| 3.6 | resolve problems within the limits of own job responsibility   |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                          |

<b>Learning outcome</b>
-------------------------

The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials 4.3 check the safe condition of the work area.

## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you installed relays and metering equipment using selected tools and equipment, in line with the work plan, risk assessment and Company procedures. Evidence to include **four** of the following installations:

- a) Tripping relays b) Auxiliary relays c) Voltage regulating relays
- d) Auto-Reclose relays e) Closing Relays f) Voltmeter/Ammeter

### **Guidance**

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, , condition / position of the apparatus to be worked on,



## Unit 390

# Install high voltage current transformer metering equipment

<b>UAN:</b>	<b>D/505/9351</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about installing high voltage current transformer (CT) metering equipment 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

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for installing high voltage current transformer metering equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of installing high voltage current transformer metering equipment and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.6 explain the organisational procedures that need to be complied with when installing high voltage current transformer metering equipment</p> <p>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare to install high voltage current transformer metering equipment</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the work location using company documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the work activity</p> <p>2.3 plan the activities required to install installing high voltage current transformer metering equipment</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear personal protective equipment (PPE) required for the job role</p> <p>2.6 select and carry out pre use checks on tools and equipment required to install high voltage current transformer metering equipment</p> <p>2.7 carry out pre work inspection of the equipment to be worked on in accordance with organisational procedures</p> <p>2.8 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. be able to install high voltage current transformer metering equipment</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 implement control measures in line with organisational procedures to meet safe control system requirements</p> <p>3.2 install high voltage current transformer metering equipment in accordance with organisational procedures</p> <p>3.3 monitor control measures to ensure risks are minimised</p> <p>3.4 confirm the finished operation meets organisational requirements and quality standards</p> <p>3.5 record the results of the operation in accordance with organisational procedures</p> <p>3.6 resolve problems within the limits of own job responsibility</p> <p>3.7 report problems outside the limits of own responsibility to designated personnel.</p>

<b>Learning outcome</b>
The learner will: 4. Be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials 4.3 check the safe condition of the work area.

## **Unit 390            Install high voltage current transformer metering equipment**

### Supporting information

#### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you installed high voltage current transformer metering equipment on **two** occasions using selected tools and equipment, in line with the work plan, risk assessment and Company procedures

#### **Guidance**

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, condition / position of the apparatus to be worked on

## Unit 391

## Diagnose faults on compressed air systems

<b>UAN:</b>	<b>H/505/9352</b>
<b>Level:</b>	3
<b>Credit value:</b>	10
<b>GLH:</b>	66
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about locating and diagnosing faults on compressed air systems in an electrical power engineering environment. It involves the rigorous use and application of diagnostic tools and techniques to establish the root cause of a fault. It also involves making recommendations on what actions need to be taken to rectify the fault.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for diagnosing faults on compressed air systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when for carrying out diagnostic testing on compressed air systems 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when carrying out diagnostic fault finding on compressed air systems |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.                                     |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 2. | be able to plan and prepare to carry out diagnostic fault finding on compressed air systems |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |   |
|-----|---|
| 2.1 | identify the work location using organisational documentation and work instructions   |
| 2.2 | apply organisational work documentation to identify the operational requirements  |
| 2.3 | plan the activities required to carry out diagnostic fault finding on compressed air systems                                    |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                                      |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role   |
| 2.6 | identify the compressed air system to be diagnosed in accordance with organisational procedures                                 |
| 2.7 | select the appropriate tools and equipment required to carry out diagnostic testing and fault finding on compressed air systems |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.  |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 3. | be able to carry out diagnostic testing and fault finding on compressed air systems |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements         |
| 3.2 | confirm the system is safe to carry out diagnostic testing operations in accordance with organisational procedures |
| 3.3 | carry out diagnostic operations in accordance with organisational procedures                                       |
| 3.4 | identify the fault and recommend actions needed to effect a repair   |
| 3.5 | record the results of the fault diagnosis operations in accordance with organisational procedures                  |
| 3.6 | analyse and interpret the results of the diagnostic testing operations   |
| 3.7 | resolve problems within the limits of own job role responsibility  |
| 3.8 | report problems outside the limits of own responsibility to designated personnel.                                  |

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 check the safe condition of the work area.

## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out diagnostic operations to diagnose faults on **two** separate compressed air systems, using appropriate diagnostic techniques and selected tools and equipment

### **Guidance**

2.6 Select tools – to include an inspection of tools and equipment:

3.1 Control measures may include

- receipt of a safety document
- points of isolation
- drain
- vent
- purge



## Unit 392

## Low voltage cable fault location and diagnosis

<b>UAN:</b>	<b>K/505/9353</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	130
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about diagnosing faults on compressed air systems in an electrical power engineering environment. It involves the rigorous use and application of diagnostic tools and techniques to establish the root cause of a fault. It also involves making recommendations on what actions need to be taken to rectify the fault.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for low voltage cable fault location and diagnosis
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to carry out low voltage cable fault location and diagnosis 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out low voltage cable fault location and diagnosis

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|--|
| 1.7 explain the processes and procedures that need to be complied with when receiving a safety document. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |  |
|--|
| 2. be able to plan and prepare to carry out low voltage cable fault location and diagnosis |
|--|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |   |
|---|
| 2.1 identify the work location using organisational documentation and work instructions                                       |
| 2.2 apply organisational work documentation to identify the operational requirements  |
| 2.3 plan the activities required to carry out low voltage cable fault location and diagnosis                                  |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                                |
| 2.5 select and wear Personal Protective Equipment (PPE) required for the job role   |
| 2.6 select the appropriate tools and equipment required to carry out low voltage cable fault location and diagnosis           |
| 2.7 inspect the apparatus on which fault location operations are to be conducted in accordance with organisational procedures |
| 2.8 inform those who will be directly and indirectly affected by the intended work plan.                                      |

<b>Learning outcome</b>
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The learner will:
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- |  |
|--|
| 3. be able to carry out low voltage cable fault location and diagnosis |
|--|

<b>Assessment criteria</b>
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The learner can:
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- |  |
|--|
| 3.1 confirm the system is safe to be operated on in accordance with organisational procedures                                |
| 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements                  |
| 3.3 carry out fault location and diagnostic operations in accordance with organisational procedures                          |
| 3.4 analyse and interpret the results of the diagnostic operations carried out to identify the fault location and root cause |
| 3.5 confirm the finished work meets organisational requirements and quality standards  |
| 3.6 record the results of the fault location and diagnostic operations in accordance with organisational procedures          |
| 3.7 provide information to update safety systems records   |
| 3.8 resolve problems within the limits of own job role responsibility  |
| 3.9 report problems outside the limits of own responsibility to designated personnel.  |

<b>Learning outcome</b>
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The learner will:
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4. Be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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# Unit 392      Low voltage cable fault location and diagnosis

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out low voltage switching operations on **two** separate occasions

Evidence to include **four** of the following switching operations performed on separate occasions on a live low voltage network

Perform diagnostic operations to determine faults, using appropriate diagnostic techniques on at least **three** of the following:

- a) Switch gear
- b) Transformers
- c) LV Boards
- d) Tap-changers
- e) CT's and VT's f) Panel wiring

Evidence to include the use of **all** of the following diagnostic techniques:

- a) Visual examination
- b) Physical examination
- c) Electrical testing

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Apparatus condition
- Environmental conditions – confined spaces, rain, wind, lightning

2.6 Select - to include inspection of the tools, equipment and ppe to be used

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

3.2 Control measures may include - identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering

## Unit 393

## Fibre optic fusion splicing and terminations

<b>UAN:</b>	<b>M/505/9354</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by
<b>Aim:</b>	This unit is about performing fibre optic fusion splicing and terminations in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed work meets the quality assurance and operating specifications set by the organisation. It also involves following and complying with health and safety measures to minimise the risk of harm and injury to self and others when undertaking and completing jointing work activities.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for carrying out fibre optic fusion splicing and terminations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to working with fibre optic cables 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of working on fibre optic cables and the control measures used to control them 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 explain the hazards of working in and around excavations and the measures used to control them

- |   |
|---|
| <p>1.7 describe the organisational procedures for accidents, incidents and emergencies to include:</p> <ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <p>1.8 explain the organisational procedures that need to be complied with when carrying out fibre optic fusion splicing and terminations.</p> |
|---|

<b>Learning outcome</b>
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The learner will:
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- |  |
|--|
| 2. be able to plan and prepare carrying out fibre optic fusion splicing and terminations |
|--|

<b>Assessment criteria</b>
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The learner can:
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- |   |
|---|
| 2.1 identify the work location using company documentation and work instructions  |
| 2.2 apply organisational work documentation to identify the work activity   |
| 2.3 plan the activities required for work on carrying out fibre optic cables  |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                            |
| 2.5 select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 select and carry out pre use checks on tools and equipment required for work on fibre optic cables                    |
| 2.7 carry out pre work inspection of the fibre optic cable/s to be worked on in accordance with organisational procedures |
| 2.8 inform those who will be directly and indirectly affected by the intended work plan.                                  |

<b>Learning outcome</b>
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The learner will:
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- |  |
|--|
| 3. be able to carry out fibre optic fusion splicing and terminations |
|--|

<b>Assessment criteria</b>
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The learner can:
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- |  |
|--|
| 3.1 implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.2 carry out testing operations on fibre optic cables in accordance with organisational procedures            |
| 3.3 carry out fibre optic splicing operations in line with work plan and organisational procedures             |
| 3.4 monitor control measures to ensure risks are minimised   |
| 3.5 confirm the finished work meets organisational requirements and quality standards                          |
| 3.6 record the results of the work implemented in accordance with organisational procedures                    |
| 3.7 resolve problems within the limits of own job responsibility   |

3.8 report problems outside the limits of own responsibility to designated personnel.
<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 393      Fibre optic fusion splicing and terminations

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **all** of the following:

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

- a) Arc fusion
- b) Mechanical

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

- a) Single mode
- b) Multi mode

### Guidance

2.6 Select and check - to include inspection of insulation and condition of PPE, tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering



## Unit 394

## Phasing out of high voltage cables

<b>UAN:</b>	<b>T/505/9355</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about phasing out high voltage cables in an electrical power engineering environment. It involves making sure that the procedures and work instructions used to complete this work are followed and applied rigorously and safely and that the finished work meets the quality assurance and operating requirements set by the organisation.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for conducting phasing out operations on high voltage cables
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of conducting phasing out operations on high voltage cables and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when phasing out high voltage cables |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.     |

<b>Learning outcome</b>
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The learner will:
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- |    |  |
|----|--|
| 2. | be able to plan and prepare to conduct phasing out operations on high voltage cables |
|----|--|

<b>Assessment criteria</b>
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The learner can:
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- |     |   |
|-----|---|
| 2.1 | identify the work location using company documentation and work instructions  |
| 2.2 | apply organisational work documentation to identify the work activity   |
| 2.3 | plan the activities required for conducting phasing out operations on high voltage cables                             |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                            |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role   |
| 2.6 | select and carry out pre use checks on tools and equipment required for phasing out operations on high voltage cables |
| 2.7 | carry out pre work inspection of the cable/s to be worked on in accordance with organisational procedures             |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                                  |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |  |
|----|--|
| 3. | be able to conduct phasing out operations on high voltage cables |
|----|--|

<b>Assessment criteria</b>
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The learner can:
------------------

- |     |  |
|-----|--|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.2 | carry out phasing out operations on high voltage cables in accordance with organisational procedures       |
| 3.3 | monitor control measures to ensure risks are minimised   |
| 3.4 | confirm the finished operation meets organisational requirements and quality standards                     |
| 3.5 | record the results of the operation in accordance with organisational procedures                           |
| 3.6 | resolve problems within the limits of own job responsibility   |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                          |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you have carried out Company approved phasing out operations on **three** separate occasions using selected tools and equipment, in line with the work plan, risk assessment and Company policy and procedures.

### **Guidance**

2.6 Select and check - to include inspection of insulation and condition of live working tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, person in attendance, condition of the cables to be worked on, environmental conditions – rain, wind, lightning

## Unit 395

## Inspect and maintain oil and gas filled cable systems

<b>UAN:</b>	<b>A/505/9356</b>
<b>Level:</b>	3
<b>Credit value:</b>	7
<b>GLH:</b>	36
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about inspecting and maintaining oil and gas filled cable systems in an electrical power engineering environment. It includes the processes and procedures that need to be rigorously and methodically followed to make sure that the finished work meets the quality assurance and operating specifications set by the organisation. It also involves using a range of tools and equipment that are fit for purpose and the wearing of personal protective equipment when performing work activities.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the inspection and maintenance of oil and gas filled cable systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to the inspection and maintenance of oil and gas filled cable systems 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning for the inspection and maintenance of oil and gas filled cable systems 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 explain the the hazards of working in and around excavations and the measures used to control them

- |     |   |
|-----|---|
| 1.7 | describe the organisational procedures for accidents, incidents and emergencies to include: <ol style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ol> |
| 1.8 | explain the organisational procedures that need to be complied with when carrying out the inspection and maintenance of oil and gas filled cable systems  |
| 1.9 | explain the processes and procedures that need to be complied with when receiving a safety document.  |

<b>Learning outcome</b>
The learner will: <ol style="list-style-type: none"> <li>2. be able to plan and prepare for the inspection and maintenance of oil and gas filled cable systems</li> </ol>
<b>Assessment criteria</b>
The learner can: <ol style="list-style-type: none"> <li>2.1 identify the work location using company documentation and work instructions</li> <li>2.2 apply organisational work documentation to identify the work activity</li> <li>2.3 plan the activities required for the inspection and maintenance of oil and gas filled cable systems</li> <li>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</li> <li>2.5 select and wear personal protective equipment (PPE) required for the job role</li> <li>2.6 select and carry out pre use checks on tools and equipment required for the inspection and maintenance of oil and gas filled cable systems</li> <li>2.7 carry out pre work inspection of the underground cable/s to be worked on in accordance with organisational procedures</li> <li>2.8 inform those who will be directly and indirectly affected by the intended work plan.</li> </ol>

<b>Learning outcome</b>
The learner will: <ol style="list-style-type: none"> <li>3. be able to carry out the inspection and maintenance of oil and gas filled cable systems</li> </ol>
<b>Assessment criteria</b>
The learner can: <ol style="list-style-type: none"> <li>3.1 implement control measures in line with organisational procedures to meet safe control system requirements</li> <li>3.2 carry out testing operations on oil and gas filled cable systems in accordance with organisational procedures</li> <li>3.3 carry out the inspection and maintenance of oil and gas filled cable systems in line with work plan and organisational procedures</li> <li>3.4 monitor control measures to ensure risks are minimised</li> </ol>

3.5	confirm the finished work meets organisational requirements and quality standards
3.6	record the results of the work implemented in accordance with organisational procedures
3.7	resolve problems within the limits of own job responsibility
3.8	report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>	
The learner will:	
4.	be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>	
The learner can:	
4.1	store tools and equipment on completion of work activity
4.2	dispose of waste materials and hazardous substances
4.3	check the safe condition of the work area.

# Unit 395      Inspect and maintain oil and gas filled cable systems

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the inspection and maintenance of oil and gas filled cable systems on **two** separate occasions

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Apparatus condition
- Environmental conditions – confined spaces, rain, wind, lightning

2.6 Select - to include inspection of the tools, equipment and ppe to be used

3.1 Control measures may include - identification of correct cable, signs/barriers, control/removal of hazards, person in attendance, traffic control, excavation shuttering



## Unit 396

## Low voltage overhead line switching operations

<b>UAN:</b>	<b>F/505/9357</b>
<b>Level:</b>	3
<b>Credit value:</b>	11
<b>GLH:</b>	105
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about low voltage overhead line switching operations in an electrical power engineering environment. It includes the processes and procedures to be followed to make sure that the completed switching operation meets the standards set by the organisation. It also involves the rigorous application of rules, regulations and work instructions to ensure that work is performed and completed safely without causing risk of injury to self and others.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for low voltage switching operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to low voltage switching operations 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning low voltage switching operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when carrying out low voltage switching operations |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.                   |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 2. | be able to plan and prepare to carry out low voltage switching operations |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |  |
|-----|--|
| 2.1 | identify the work location using organisational documentation and work instructions                                  |
| 2.2 | apply organisational work documentation to identify the operational requirements                                     |
| 2.3 | plan the activities required to carry out low voltage switching operations   |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                           |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role  |
| 2.6 | select the appropriate tools and equipment required to carry out low voltage switching operations                    |
| 2.7 | inspect the apparatus on which switching operations are to be conducted in accordance with organisational procedures |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                                 |

<b>Learning outcome</b>
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The learner will:
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- |    |   |
|----|---|
| 3. | be able to carry out low voltage switching operations |
|----|---|

<b>Assessment criteria</b>
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The learner can:
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- |     |   |
|-----|---|
| 3.1 | confirm the system is safe to be operated on in accordance with organisational procedures               |
| 3.2 | implement the work plan in line with organisational procedures to meet safe control system requirements |
| 3.3 | carry out low voltage switching operations in accordance with organisational procedures                 |
| 3.4 | confirm the finished work meets organisational requirements and quality standards                       |
| 3.5 | record the results of the work implemented in accordance with organisational procedures                 |
| 3.6 | resolve problems within the limits of own job role responsibility                                       |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                       |

<b>Learning outcome</b>
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The learner will:
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4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out live low voltage overhead line switching operations on **three** of the following:

- a) Pole mounted LV mains fuses
- b) Overhead line bows/jumpers
- c) Overhead line isolators
- d) Ground mounted LV mains fuses/links
- e) Transformer links
- f) Castle/Interlocked systems

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – confined spaces, rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

<b>UAN:</b>	<b>J/505/9358</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	130
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about overhead line fault diagnosis in an electrical power engineering environment. It involves the rigorous use and application of diagnostic tools and techniques to establish the root cause of a fault. It also involves making recommendations on what actions need to be taken to rectify the fault.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for overhead line fault diagnosis
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on overhead line networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when carrying out overhead line fault diagnosis 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out overhead line fault diagnosis 1.7 explain the processes and procedures that need to be complied with when receiving a safety document.

**Learning outcome**

The learner will:

2. be able to plan and prepare to diagnose faults on overhead line networks

**Assessment criteria**

The learner can:

- 2.1 identify the work location using organisational documentation and work instructions
- 2.2 apply organisational work documentation to identify the operational requirements
- 2.3 plan the activities required to carry out overhead line fault diagnosis operations
- 2.4 carry out a site specific risk assessment in accordance with health and safety regulations
- 2.5 select and wear Personal Protective Equipment (PPE) required for the job role
- 2.6 identify the faulted apparatus to be diagnosed, including its points of isolation in accordance with organisational procedures
- 2.7 select the appropriate tools and equipment required to carry out overhead line fault diagnosis operations
- 2.8 inform those who will be directly and indirectly affected by the intended work plan.

**Learning outcome**

The learner will:

3. be able to carry out overhead line fault diagnosis

**Assessment criteria**

The learner can:

- 3.1 confirm the system is safe to work on in accordance with organisational procedures
- 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements
- 3.3 carry out overhead line fault diagnosis operations in accordance with organisational procedures
- 3.4 confirm the finished work meets organisational requirements and quality standards
- 3.5 record the results of the fault diagnosis in accordance with organisational procedures
- 3.6 review and analyse the results of the fault diagnosis operations
- 3.7 identify the fault and recommend actions needed to effect a repair
- 3.8 resolve problems within the limits of own job role responsibility
- 3.9 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have determine the type and position of a fault on **both** high voltage and low voltage overhead networks. Evidence to including the use of **all** of the following diagnostic techniques:

- a) Visual examination
  - b) Physical examination
  - c) Electrical testing
  - d) Interpretation of information from plans
- (e.g. two techniques on a high voltage fault and two on a low voltage fault)

### **Guidance**

2.4. a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – adequate lighting, rain, wind, lightning



## Unit 398

# High voltage live line operations using insulated rods

<b>UAN:</b>	<b>L/505/9359</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by
<b>Aim:</b>	This unit is about high voltage live line operations using insulated rods. It involves inspecting the completed work to make sure it meets quality assurance and operating requirements. It also involves the following of procedures to ensure that safe working practices are adopted throughout the duration of the work.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for high voltage live line operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to high voltage live line operations 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning high voltage live line operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out high voltage live line operations

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|--|
| 1.7 explain the processes and procedures that need to be complied with when receiving a safety document. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 2. be able to plan and prepare to carry out high voltage live line operations |
|---|

<b>Assessment criteria</b>
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The learner can:
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- |   |
|---|
| 2.1 identify the work location using organisational documentation and work instructions                                 |
| 2.2 apply organisational work documentation to identify the operational requirements                                    |
| 2.3 plan the activities required to carry out high voltage live line operations   |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                          |
| 2.5 select and wear Personal Protective Equipment (PPE) required for the job role                                       |
| 2.6 identify the system to be worked on, including its points of isolation in accordance with organisational procedures |
| 2.7 inspect the system on which live line operations are to be conducted in accordance with organisational procedures   |
| 2.8 select the appropriate tools and equipment required to carry out high voltage live line operations                  |
| 2.9 inform those who will be directly and indirectly affected by the intended work plan.                                |

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 3. be able to carry out high voltage live line operations |
|---|

<b>Assessment criteria</b>
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The learner can:
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- |   |
|---|
| 3.1 confirm the system is safe to be operated on in accordance with organisational procedures |
| 3.2 carry out high voltage live line operations in accordance with organisational procedures  |
| 3.3 confirm the completed live line operation has achieved the operational objective          |
| 3.4 record the live line operation in accordance with organisational procedures               |
| 3.5 resolve problems within the limits of own job role responsibility                         |
| 3.6 report problems outside the limits of own responsibility to designated personnel.         |

<b>Learning outcome</b>
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The learner will:
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- |  |
|--|
| 4. be able to leave the work area in a safe condition according to required regulation and legislation |
|--|

<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 check the safe condition of the work area.

# Unit 398 High voltage live line operations using insulated rods

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out Company approved high voltage live line operations on **three** separate occasions.

### Guidance

2.4. a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – visibility, rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 399

## High voltage hot stick operations

<b>UAN:</b>	<b>T/505/9369</b>
<b>Level:</b>	3
<b>Credit value:</b>	4
<b>GLH:</b>	42
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about high voltage hot stick operations in an electrical power engineering environment. It involves inspecting the completed work to make sure it meets quality assurance and operating requirements. It also involves the following of procedures to ensure that safe working practices are adopted throughout the duration of the work.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for high voltage hot stick operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to high voltage overhead line operations 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning high voltage hot stick operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out high voltage hot stick operations

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|--|
| 1.7 explain the processes and procedures that need to be complied with when receiving a safety document. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 2. be able to plan and prepare to carry out high voltage hot stick operations |
|---|

<b>Assessment criteria</b>
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The learner can:
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- |  |
|--|
| 2.1 identify the work location using organisational documentation and work instructions                                  |
| 2.2 apply organisational work documentation to identify the operational requirements                                     |
| 2.3 plan the activities required to carry out hot stick operations   |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                           |
| 2.5 select and wear Personal Protective Equipment (PPE) required for the job role  |
| 2.6 identify the system to be worked on, including its points of isolation in accordance with organisational procedures  |
| 2.7 inspect the apparatus on which hot stick operations are to be conducted in accordance with organisational procedures |
| 2.8 select the appropriate tools and equipment required to carry out hot stick operations                                |
| 2.9 inform those who will be directly and indirectly affected by the intended work plan.                                 |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |  |
|--|
| 3. be able to carry out hot stick operations |
|--|

<b>Assessment criteria</b>
----------------------------

The learner can:
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- |   |
|---|
| 3.1 confirm the system is safe to be operated on in accordance with organisational procedures               |
| 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements |
| 3.3 carry out hot stick operations in accordance with organisational procedures                             |
| 3.4 confirm the finished work meets organisational requirements and quality standards                       |
| 3.5 record the results of the work implemented in accordance with organisational procedures                 |
| 3.6 resolve problems within the limits of own job role responsibility                                       |
| 3.7 report problems outside the limits of own responsibility to designated personnel.                       |

<b>Learning outcome</b>
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The learner will:
-------------------

4. be able to leave the work area in a safe condition according to required regulation and legislation
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<b>Assessment criteria</b>
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The learner can:
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4.1 store tools and equipment on completion of work activity
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4.2 check the safe condition of the work area.
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### Supporting information

#### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out Company approved high voltage hot stick operations on **three** separate occasions.

#### Guidance

2.4. a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – visibility, rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge



<b>UAN:</b>	<b>F/505/9360</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about hot glove operations in an electrical power engineering environment. It involves inspecting the completed work to make sure it meets quality assurance and operating requirements. It also involves the following of procedures to ensure that safe working practices are adopted throughout the duration of the work.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for hot glove operations
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to high voltage overhead line operations 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning hot glove operations 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out high voltage hot glove operations 1.7 explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare to carry out hot glove operations
<b>Assessment criteria</b>
The learner can: 2.1 identify the work location using organisational documentation and work instructions 2.2 apply organisational work documentation to identify the operational requirements 2.3 plan the activities required to carry out hot glove operations 2.4 carry out a site specific risk assessment in accordance with health and safety regulations 2.5 select and wear Personal Protective Equipment (PPE) required for the job role 2.6 identify the system to be worked on, including its points of isolation in accordance with organisational procedures 2.7 inspect the apparatus on which hot glove operations are to be conducted in accordance with organisational procedures 2.8 select the appropriate tools and equipment required to carry out hot glove operations 2.9 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will: 3. be able to carry out hot glove operations
<b>Assessment criteria</b>
The learner can: 3.1 confirm the system is safe to be operated on in accordance with organisational procedures 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements 3.3 carry out hot glove operations in accordance with organisational procedures 3.4 confirm the finished work meets organisational requirements and quality standards 3.5 record the results of the work implemented in accordance with organisational procedures 3.6 resolve problems within the limits of own job role responsibility 3.7 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>

The learner can:

- 4.1 store tools and equipment on completion of work activity
- 4.2 check the safe condition of the work area.

## Unit 408 Hot glove operations

### Supporting information

#### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out company approved hot glove operations on **two** separate occasions.

#### Guidance

2.4. a site specific risk assessment should take into consideration:

- Apparatus identification
- Apparatus condition
- Environmental conditions – visibility, rain, wind, lightning

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 409

# Install overhead line apparatus on steel tower structures

<b>UAN:</b>	<b>J/505/9361</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	102
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about the installation of overhead line apparatus on steel tower structures in an electrical power engineering environment. It involves following set operational procedures and processes to ensure the network is safe to work on and the identification and control of hazards in the work area. It also involves using a range of tools and equipment to carry out the installation and complying with technical design specifications to ensure the completed work meets with organisational and technical requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for work on overhead line steel tower structures
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the installation and configuration of apparatus on steel tower structures 1.5 describe the organisational procedures for accidents, incidents and emergencies to include:

	<ul style="list-style-type: none"> <li>a) fire</li> <li>b) injury to self and others</li> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul>
1.6	explain the organisational procedures that need to be complied with when working on overhead line steel tower structures
1.7	explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>	
The learner will:	
2.	be able to plan and prepare to install and configure apparatus on steel tower structures
<b>Assessment criteria</b>	
The learner can:	
2.1	identify the work location using organisational documentation and work instructions
2.2	apply organisational work documentation to identify the work activity
2.3	plan the activities required for the installation of overhead line plant and equipment
2.4	carry out a site specific risk assessment in accordance with health and safety regulations
2.5	select and wear Personal Protective Equipment (PPE) required for the job role
2.6	identify the system to be worked on, including its points of isolation in accordance with organisational procedures
2.7	identify the apparatus to be installed/configured in line with organisational procedures
2.8	select the appropriate tools and equipment required to install the overhead line plant and equipment
2.9	inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>	
The learner will:	
3.	be able to install and configure apparatus on steel tower structures
<b>Assessment criteria</b>	
The learner can:	
3.1	confirm the system is safe to work on in accordance with organisational procedures
3.2	implement the work plan in line with organisational procedures to meet safe control system requirements
3.3	carry out the work in line with work plan and organisational procedures
3.4	confirm the finished work meets organisational requirements and quality standards
3.5	record the results of the work implemented in accordance with organisational procedures
3.6	resolve problems within the limits of own job role responsibility

3.7 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

4.1 store tools and equipment on completion of work activity

4.2 dispose of waste materials and hazardous substances

4.3 check the safe condition of the work area.

## Unit 409      Install overhead line apparatus on steel tower structures

### Supporting information

#### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out installation and configuration work on steel tower structures on **two** different occasions.

And carried out the installation and configuration of **two** different types of the apparatus listed –

- a. Cable Terminations
- b. Surge Arrestors
- c. Telecommunications/Fibre Optics

#### Guidance

2.4 a site specific risk assessment should take into consideration:

- Environmental conditions – rain, wind, fog, lightning
- Person in attendance when working at height
- Control/removal of hazards
- Circuit Identification - pennants/flags
- Rescue equipment available

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge



## Unit 410

# Fault repair of overhead line apparatus on steel tower structures

<b>UAN:</b>	<b>L/505/9362</b>
<b>Level:</b>	3
<b>Credit value:</b>	13
<b>GLH:</b>	102
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about fault repair of overhead line and apparatus on steel tower structures in an electrical power engineering environment. It involves following routine fault rectification and repair procedures. It also involve inspecting the finished repair and rectification work to make sure it's operates in a manner that meets operating specifications and quality standards and criteria set by the organisation.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for fault repair on overhead line steel tower structures
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead line power equipment 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when carrying out fault repair work on overhead line steel tower structures 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others

<ul style="list-style-type: none"> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <ul style="list-style-type: none"> <li>1.6 explain the organisational procedures that need to be complied with when carrying out fault repair work on overhead line steel tower structures</li> <li>1.7 explain the processes and procedures that need to be complied with when receiving a safety document.</li> </ul>
--

<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare to carry out fault repair on overhead line steel tower structures
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location using organisational documentation and work instructions
2.2 apply organisational work documentation to identify the work activity
2.3 plan the activities required to carry out the repair work
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear Personal Protective Equipment (PPE) required for the job role
2.6 identify the power equipment to be installed in line with organisational procedures
2.7 select the appropriate tools and equipment required to install the overhead line plant and equipment
2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to carry out fault repair on overhead line steel tower structures
<b>Assessment criteria</b>
The learner can:
3.1 confirm the system is safe to work on in accordance with organisational procedures including
3.2 implement the work plan in line with organisational procedures to meet safe control system requirements
3.3 carry out fault repair work in line with work plan and organisational procedures
3.4 confirm the finished work meets organisational requirements and quality standards
3.5 record the results of the work implemented in accordance with organisational procedures
3.6 resolve problems within the limits of own job role responsibility
3.7 report problems outside the limits of own responsibility to designated personnel.

**Learning outcome**

The learner will:

4. be able to leave the work area in a safe condition according to required regulation and legislation

**Assessment criteria**

The learner can:

- 4.1 store tools and equipment on completion of work activity
- 4.2 dispose of waste materials
- 4.3 check the safe condition of the work area.

# Unit 410      **Fault repair of overhead line apparatus on steel tower structures**

## Supporting information

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out fault repair on steel tower structures on **two** different occasions.

And carried out the installation and configuration of **two** different types of the apparatus listed –

- a. Conductors
- b. Apparatus
- c. Fittings
- d. Structure
- e. Anti-climbing devices

### **Guidance**

2.4 a site specific risk assessment should take into consideration:

- Environmental conditions – rain, wind, fog, lightning
- Person in attendance when working at height
- Control/removal of hazards
- Circuit Identification - pennants/flags
- Rescue equipment available

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 411

## Earthing of overhead line transmission conductors

<b>UAN:</b>	<b>R/505/9363</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about earthing of overhead line transmission conductors in an electrical power engineering environment. It involves using tools and equipment to make sure the earthing of plant and apparatus is conducted safely and in accordance with health and safety rules and regulations.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the earthing of overhead line transmission conductors
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead lines 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the earthing of overhead line transmission conductors 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when earthing overhead line transmission conductors

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|--|
| 1.7 explain the processes and procedures that need to be complied with when receiving a safety document. |
|--|

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 2. be able to plan and prepare to carry out the earthing of overhead line transmission conductors |
|---|

<b>Assessment criteria</b>
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The learner can:
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- |  |
|--|
| 2.1 identify the work location using organisational documentation and work instructions                                    |
| 2.2 apply organisational work documentation to identify the work activity  |
| 2.3 plan the activities required for the earthing of overhead line transmission conductors                                 |
| 2.4 carry out a site specific risk assessment in accordance with health and safety regulations                             |
| 2.5 select and wear Personal Protective Equipment (PPE) required for the job role  |
| 2.6 inspect the conductors to be earthed in accordance with organisational procedures                                      |
| 2.7 select the appropriate tools and equipment required to carry out the earthing of overhead line transmission conductors |
| 2.8 inform those who will be directly and indirectly affected by the intended work plan.                                   |

<b>Learning outcome</b>
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The learner will:
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- |   |
|---|
| 3. be able to carry out the earthing of overhead line transmission conductors |
|---|

<b>Assessment criteria</b>
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The learner can:
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- |  |
|--|
| 3.1 confirm the conductors are safe to earth in accordance with organisational procedures                        |
| 3.2 implement the work plan in line with organisational procedures to meet safe control system requirements      |
| 3.3 carry out the earthing of overhead line transmission conductors in accordance with organisational procedures |
| 3.4 confirm the finished work meets organisational requirements and quality standards                            |
| 3.5 record the results of the work implemented in accordance with organisational procedures                      |
| 3.6 resolve problems within the limits of own job role responsibility  |
| 3.7 report problems outside the limits of own responsibility to designated personnel.                            |

<b>Learning outcome</b>
-------------------------

The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 check the safe condition of the work area.

# Unit 411      Earthing of overhead line transmission conductors

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the earthing of overhead line transmission conductors on at least **two** different occasions

To include **one** Dress earthing scheme and **one** through current earthing scheme

### Guidance

2.4 a site specific risk assessment should take into consideration:

- Electrical clearances
- Circuit identification - pennants/flags
- Condition of the conductors
- Environmental conditions – rain, wind, fog, lightning
- Person in attendance when working at height
- Control/removal of hazards

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge



## Unit 412

## Erection of steel tower structures

<b>UAN:</b>	<b>Y/505/9364</b>
<b>Level:</b>	3
<b>Credit value:</b>	10
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	<p>This unit is about the erection of steel tower structures in an electrical power engineering environment.</p> <p>It involves completing installation activities following processes and procedures to make sure that the finished work meets the quality assurance and operating specifications set by the organisation.</p>

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for the erection of steel tower structures
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work at height on overhead lines 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the erection of steel tower structures 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses 1.6 explain the organisational procedures that need to be complied with when carrying out the erection of steel tower structures 1.7 explain the processes and procedures that need to be complied with when receiving a safety document.

<b>Learning outcome</b>
The learner will: 2. be able to plan and prepare to carry out the erection of steel tower structures
<b>Assessment criteria</b>
The learner can: 2.1 identify the work location using organisational documentation and work instructions 2.2 apply organisational work documentation to identify the work activity 2.3 plan the activities required for the erection of steel tower structures 2.4 carry out a site specific risk assessment in accordance with health and safety regulations 2.5 select and wear Personal Protective Equipment (PPE) required for the job role 2.6 inspect the steelwork to be erected in accordance with organisational procedures and manufacturers specifications 2.7 select the appropriate tools and equipment required to carry out the erection of a steel tower structure 2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will: 3. be able to carry out the erection of steel tower structures
<b>Assessment criteria</b>
The learner can: 3.1 implement control measures in line with organisational procedures to meet safe systems of work 3.2 carry out the erection of tower steelwork in accordance with organisational procedures 3.3 monitor control measures when lifting and moving tower steelwork to ensure risks are minimised 3.4 check the steelwork is located and secured in accordance with the work plan and manufacturers specifications 3.5 resolve problems within the limits of own job role responsibility 3.6 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances

## **Unit 412                      Erection of steel tower structures**

### Supporting information

#### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the erection of steel tower structures on at least **one** occasion:

Evidence to include **one** lifting plan

#### **Guidance**

Evidence could include the use of Cranes, Telehandlers, JIB Poles and Derricks.

2.4 a site specific risk assessment should take into consideration:

- steelwork – size, weight, stability, lifting points
- lifting route to be taken
- traffic, pedestrians
- barriers, fencing
- clearances, obstructions
- environmental conditions – rain, wind, lightning

This unit should be taken in association with Unit 304 Coordinate the Mechanical Movement of Power Plant and Apparatus

<b>UAN:</b>	<b>D/505/9365</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	96
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out maintenance operations on power transformers in an electrical power engineering environment. It involves following set processes and procedures to ensure the system is safe to work on and the identification and control of hazards in the work area. It also involves the planning and organisation of resources to carry out maintenance activities and testing operations to ensure the completed maintenance work meets with technical specifications and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for maintaining power transformers
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to maintain power transformers 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others

<ul style="list-style-type: none"> <li>c) threat of terrorism</li> <li>d) hazardous occurrences and near misses</li> </ul> <ul style="list-style-type: none"> <li>1.7 explain the organisational procedures that need to be complied with when maintaining power transformers</li> <li>1.8 explain the processes and procedures that need to be complied with when receiving a safety document.</li> </ul>
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<b>Learning outcome</b>
The learner will:
2. be able to plan and prepare to maintain power transformers
<b>Assessment criteria</b>
The learner can:
2.1 identify the work location using organisational documentation and work instructions
2.2 apply organisational work documentation to identify the work activity
2.3 plan the activities required for the maintenance of power transformers
2.4 carry out a site specific risk assessment in accordance with health and safety regulations
2.5 select and wear personal protective equipment (PPE) required for the job role
2.6 identify and carry out a pre work inspection of the power transformer to be maintained in line with organisational procedures
2.7 select suitable tools and equipment required to maintain the power transformer
2.8 inform those who will be directly and indirectly affected by the intended work plan.

<b>Learning outcome</b>
The learner will:
3. be able to maintain power transformers
<b>Assessment criteria</b>
The learner can:
3.1 confirm the system is safe to work on in accordance with organisational procedures
3.2 implement control measures in line with organisational procedures to meet safe control system requirements
3.3 maintain the power transformer in line with work plan and organisational procedures
3.4 monitor control measures to ensure risks are minimised
3.5 confirm the finished work meets organisational requirements and quality standards
3.6 record the results of the work implemented in accordance with organisational procedures
3.7 resolve problems within the limits of own job role responsibility
3.8 report problems outside the limits of own responsibility to designated personnel.

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 413          Maintain power transformers

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You need to provide evidence to show that you have carried out the maintenance of power transformers on **two** separate occasions which includes the coverage of **all** the following items:

- Main tank (including protection devices)
- Selector
- Diverter

### Guidance

3.1 points to be considered

- points of isolation
- earthing arrangements
- drain
- vent
- purge

3.2 Control measures may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge

## Unit 414

# Maintain supervisory control and data acquisition (SCADA) systems

<b>UAN:</b>	<b>H/505/9366</b>
<b>Level:</b>	3
<b>Credit value:</b>	16
<b>GLH:</b>	102
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about maintaining Supervisory Control and Data Acquisition (SCADA) systems in an electrical power engineering environment. It involves completing maintenance 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.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for maintaining Supervisory Control and Data Acquisition (SCADA) systems
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards of maintaining SCADA systems and the control measures used to control them 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses



- |     |  |
|-----|--|
| 1.6 | explain the organisational procedures that need to be complied with when maintaining SCADA systems   |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document. |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |   |
|----|---|
| 2. | be able to plan and prepare to carry out the maintenance of SCADA systems |
|----|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |   |
|-----|---|
| 2.1 | identify the work location using company documentation and work instructions                                |
| 2.2 | apply organisational work documentation to identify the work activity                                       |
| 2.3 | plan the activities required for maintaining SCADA systems  |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations                  |
| 2.5 | select and wear personal protective equipment (PPE) required for the job role                               |
| 2.6 | select and carry out pre use checks on tools and equipment required for maintaining SCADA systems           |
| 2.7 | carry out pre work inspection of the equipment to be worked on in accordance with organisational procedures |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.                        |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |                                   |
|----|-----------------------------------|
| 3. | be able to maintain SCADA systems |
|----|-----------------------------------|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |  |
|-----|--|
| 3.1 | implement control measures in line with organisational procedures to meet safe control system requirements |
| 3.2 | maintain SCADA systems in accordance with organisational procedures  |
| 3.3 | monitor control measures to ensure risks are minimised   |
| 3.4 | confirm the finished operation meets organisational requirements and quality standards                     |
| 3.5 | record the results of the operation in accordance with organisational procedures                           |
| 3.6 | resolve problems within the limits of own job responsibility   |
| 3.7 | report problems outside the limits of own responsibility to designated personnel.                          |

<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and equipment on completion of work activity 4.2 dispose of waste materials 4.3 check the safe condition of the work area.

# Unit 414      **Maintain supervisory control and data acquisition (SCADA) systems**

## **Supporting information**

### **Evidence requirements**

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that that you have carried out the maintenance of a SCADA system and associated RTU equipment on **three** occasions in line with the work plan, risk assessment and Company procedures

### **Guidance**

2.6 Select and check - to include inspection of tools and equipment

3.1 Control measures may include – receipt of a safety document, identification of circuit, signs/barriers, control/removal of hazards, person in attendance, condition of the apparatus to be worked on, environmental conditions – rain, wind, lightning

## Unit 415

## Electrical testing of power equipment

<b>UAN:</b>	<b>A/505/9308</b>
<b>Level:</b>	3
<b>Credit value:</b>	15
<b>GLH:</b>	150
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about carrying out electrical testing procedures on a range of power equipment in an electrical power engineering environment. It involves following stringent processes and procedures to ensure the testing operations are carried out safely. It also involves the methodical planning of tasks and the use of a range of test equipment to support the analysis and recording of test results in line with organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand organisational procedures and legislative requirements for electrical testing of power equipment
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations applicable to work on power networks 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning the electrical testing of power equipment 1.5 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism d) hazardous occurrences and near misses

- |     |   |
|-----|---|
| 1.6 | explain the organisational procedures that need to be complied with for electrical testing of power equipment |
| 1.7 | explain the processes and procedures that need to be complied with when receiving a safety document.          |

<b>Learning outcome</b>
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The learner will:
-------------------

- |    |   |
|----|---|
| 2. | be able to plan and prepare for electrical testing of power equipment |
|----|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |  |
|-----|--|
| 2.1 | identify the work location using organisational documentation and work instructions        |
| 2.2 | apply organisational work documentation to identify the work activity                      |
| 2.3 | plan the activities required for electrical testing of power equipment                     |
| 2.4 | carry out a site specific risk assessment in accordance with health and safety regulations |
| 2.5 | select and wear Personal Protective Equipment (PPE) required for the job role              |
| 2.6 | inspect the power equipment to be tested in line with organisational procedures            |
| 2.7 | select the appropriate test and equipment for electrical testing                           |
| 2.8 | inform those who will be directly and indirectly affected by the intended work plan.       |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |   |
|----|---|
| 3. | be able to carry out electrical testing procedures on power equipment |
|----|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |     |   |
|-----|---|
| 3.1 | implement control measures to ensure work area is safe for testing procedures     |
| 3.2 | carry out electrical testing in line with work plan and organisational procedures |
| 3.3 | interpret and record the results of tests in line with organisational procedures  |
| 3.4 | resolve problems within the limits of own job role responsibility                 |
| 3.5 | report problems outside the limits of own responsibility to designated personnel. |

<b>Learning outcome</b>
-------------------------

The learner will:
-------------------

- |    |   |
|----|---|
| 4. | be able to leave the work area in a safe condition according to required regulation and legislation |
|----|---|

<b>Assessment criteria</b>
----------------------------

The learner can:
------------------

- |   |
|---|
| 4.1 store tools and test equipment on completion of work activity |
| 4.2 dispose of waste materials and hazardous substances           |
| 4.3 check the safe condition of the work area.                    |

## Unit 415 Electrical testing of power equipment

### Supporting information

#### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **two** different occasions you carried out **two** of the following:

- voltage
- polarity
- insulation resistance
- earth loop impedance
- three-phase testing
- phase rotation
- continuity
- joint resistance
- timing
- oil dielectric
- Buchholz test
- winding temperature indicator

#### Guidance

3.1 factors to be considered

- signs and barriers
- shrouding
- control/removal of hazards
- person in attendance

## Unit 416

## Install substation plant and apparatus

<b>UAN:</b>	<b>L/505/9278</b>
<b>Level:</b>	3
<b>Credit value:</b>	17
<b>GLH:</b>	140
<b>Assessment requirements specified by a sector or regulatory body:</b>	This unit is endorsed by EU Skills
<b>Aim:</b>	This unit is about installing substation plant and apparatus in an electrical power engineering environment. It involves the planning and organisation of resources and following set operational procedures to ensure the system is safe to work on before undertaking installation activities. It also involves using and complying with technical design specifications to ensure the completed installation meets with technical and organisational requirements.

<b>Learning outcome</b>
The learner will: 1. understand the statutory regulations and procedures required for work on substation plant and apparatus
<b>Assessment criteria</b>
The learner can: 1.1 describe the main principles of health and safety legislation and regulations relating to work on substation plant and apparatus 1.2 describe roles and responsibilities of employees and employers in relation to organisational procedures and legislative requirements 1.3 explain the limitations of own job responsibility and reporting procedures for any work related problems 1.4 explain the hazards to be considered when planning to install substation plant and apparatus 1.5 explain what materials and substances are hazardous to health in relation to job role 1.6 describe the organisational procedures for accidents, incidents and emergencies to include: a) fire b) injury to self and others c) threat of terrorism

<p>d) hazardous occurrences and near misses</p> <p>1.7 explain the organisational procedures that need to be complied with when installing plant and substation apparatus</p> <p>1.8 explain the processes and procedures that need to be complied with when receiving a safety document.</p>
---

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. be able to plan and prepare for installing substation plant and apparatus</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 identify the work location using organisational documentation and work instructions</p> <p>2.2 apply organisational work documentation to identify the work activity</p> <p>2.3 plan the activities required for installing substation plant and apparatus</p> <p>2.4 carry out a site specific risk assessment in accordance with health and safety regulations</p> <p>2.5 select and wear personal protective equipment (PPE) required for the job role</p> <p>2.6 identify and carry out a pre work inspection of the apparatus to be installed in line with organisational procedures</p> <p>2.7 select suitable tools and equipment required to maintain the substation apparatus</p> <p>2.8 inform those who will be directly and indirectly affected by the intended work plan.</p>

<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>3. be able to install substation plant and apparatus</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>3.1 confirm the system is safe to work on in accordance with organisational procedures</p> <p>3.2 implement control measures in line with organisational procedures to meet safe control system requirements</p> <p>3.3 install substation apparatus in line with work plan and organisational procedures</p> <p>3.4 monitor control measures to ensure risks are minimised</p> <p>3.5 confirm the finished work meets organisational requirements and quality standards</p> <p>3.6 record the results of the work implemented in accordance with organisational procedures</p> <p>3.7 resolve problems within the limits of own job role responsibility</p> <p>3.8 report problems outside the limits of own responsibility to designated personnel.</p>



<b>Learning outcome</b>
The learner will: 4. be able to leave the work area in a safe condition according to required regulation and legislation
<b>Assessment criteria</b>
The learner can: 4.1 store tools and test equipment on completion of work activity 4.2 dispose of waste materials and hazardous substances 4.3 check the safe condition of the work area.

# Unit 416      Install substation plant and apparatus

## Supporting information

### Evidence requirements

You must provide your assessor with evidence for all the learning outcomes and assessment criteria. The evidence must be provided in the following ways taking into account any of the special considerations below.

You will need to provide evidence to show that on at least **three** different occasions you carried out **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

### Guidance

3.2 Control measures may include

- receipt of a safety document
- points of isolation
- earthing arrangements
- drain
- vent
- purge

2.7 Select tools – to include an inspection of condition e.g. insulation



## Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **[www.cityandguilds.com](http://www.cityandguilds.com)**.

***Centre Manual - Supporting Customer Excellence*** contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

***Our Quality Assurance Requirements*** encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

**Access to Assessment & Qualifications** provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

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## Useful contacts

<b>UK learners</b> <b>General qualification information</b>	<b>T: +44 (0)844 543 0033</b> <b>E: learnersupport@cityandguilds.com</b>
<b>International learners</b> General qualification information	T: +44 (0)844 543 0033 F: +44 (0)20 7294 2413 E: <b>intcg@cityandguilds.com</b>
<b>Centres</b> 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: <b>centresupport@cityandguilds.com</b>
<b>Single subject qualifications</b> 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: <b>singlesubjects@cityandguilds.com</b>
<b>International awards</b> 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: <b>intops@cityandguilds.com</b>
<b>Walled Garden</b> 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: <b>walledgarden@cityandguilds.com</b>
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