

Diplomas for Electrical Power Engineering at SCQF Level 6 (2343) [46- 49]

May 2014 Version 1.1



Qualification at a glance

Subject area	Electrical Power Engineering
City & Guilds number	2343
Age group approved	16-18, 19+
Entry requirements	N/a
Assessment	Portfolio
Support materials	Centre handbook Unit pack
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	SQA Accreditation number
Diploma for Electrical Power Engineering (Overhead Linesperson) at SCQF Level 6	2343-46	R381 04
Diploma for Electrical Power Engineering (Fitter) at SCQF Level 6	2343-47	R379 04
Diploma for Electrical Power Engineering (Jointer) at SCQF Level 6	2343-48	R380 04
Diploma for Electrical Power Engineering (Technician) at SCQF Level 6	2343-49	R378 04

Date and version number	Change detail	Section
February 2016 V1.1	Change in the City & Guilds Group statement	Useful contacts
	Phone numbers deleted	Useful contacts



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1 Introduction

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

Area	Description
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

Below is a summary of the minimum credit requirements to achieve each qualification. For the full qualification structure and unit content, please refer to the associated qualification unit handbook.

1. To achieve the **Diploma for Electrical Power Engineering (Overhead Linesperson) at SCQF Level 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). Learners can make up the remaining credits from either optional group A, B or C to total a minimum of **81** credits.
2. To achieve the **Diploma for Electrical Power Engineering (Fitter) at SCQF Level 6**, learners must achieve **21** credits the mandatory group, a minimum of **14** credits from mandatory optional group A and a minimum of **16** credits from mandatory optional group B (group B2). Learners can make up the remaining credits from either optional group A, B or C to total a minimum of **81** credits.
3. To achieve the **Diploma for Electrical Power Engineering (Jointer) at SCQF Level 6**, learners must achieve **21** credits the mandatory group, a minimum of **14** credits from mandatory optional group A and a minimum of **15** credits from mandatory optional group B (group B3). Learners can make up the remaining credits from either optional group A, B or C to total a minimum of **81** credits.
4. To achieve the **Diploma for Electrical Power Engineering (Technician) at SCQF Level 6**, learners must achieve **21** credits the mandatory group, a minimum of **14** credits from mandatory optional group A and 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.



2 Centre requirements

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, or be working towards, the relevant Assessor/Internal Quality Assurer TAQA qualification for their role in delivering, assessing and verifying these qualifications, or 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.

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 SCQF 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 reference number
- title
- level
- credit value
- guided learning hours
- unit aim
- learning outcomes which are comprised of a number of assessment criteria

Summary of units

Unit	Title	Level	Credits
201	Comply with statutory regulations and organisational safety requirements	5	7
214	Access, movement and egress of high voltage overhead line work areas	5	1
223	Inspection and maintenance of battery systems	5	7
224	Install substation earthing	5	7
228	Access, movement and egress of high voltage substation work areas	5	1
302	Minimise risk to life, property and the environment	6	14
303	Control of working parties	6	14
304	Coordinate the mechanical movement of power plant and apparatus	6	14
306	High voltage switching operations	6	11
307	Install overhead line plant and equipment	6	16
308	Dismantle overhead line plant and equipment	6	16
309	Live low voltage overhead line connections	6	15
310	Jointing overhead line conductors	6	13
311	Install overhead line conductors	6	13

312	Maintain overhead plant and equipment	6	13
313	Inspection of overhead line routes	6	6
315	Low voltage distribution cable jointing	6	15
316	Low voltage consac underground cable jointing	6	15
317	High voltage distribution underground cable jointing	6	15
318	High voltage polymeric transmission cable jointing	6	15
319	High voltage pressurised transmission cable jointing	6	15
321	Dismantle substation plant and apparatus	6	17
322	Maintain substation switchgear	6	16
325	Fault repair of substation plant and apparatus	6	18
326	Maintain compressed air systems	6	16
327	Coordinate work activities on plant and apparatus	6	17
329	Develop yourself in the work role	6	6
330	Organise the use of resources for work on power networks	6	17
331	Produce, communicate and record technical information for work on power networks	6	15
332	Low voltage sub-station switching operations	6	11
333	Diagnostic testing and fault finding on power networks	6	16
334	Protection testing on overcurrent and earth fault schemes	6	16
335	Pressure testing of high voltage distribution equipment	6	16
336	Install supervisory control and data acquisition (SCADA) systems	6	4
337	Install protective relays and metering equipment	6	4
338	Install high voltage current transformer metering equipment	6	4
339	Diagnose faults on compressed air systems	6	10
340	Low voltage cable fault location and diagnosis	6	13
341	Fibre optic fusion splicing and terminations	6	4
342	Phasing out of high voltage cables	6	15

343	Inspect and maintain oil and gas filled cable systems	6	7
344	Low voltage overhead line switching operations	6	11
345	Overhead line fault diagnosis	6	13
346	High voltage live line operations using insulated rods	6	4
347	Hot stick operations	6	4
348	Hot glove operations	6	15
349	Install overhead line apparatus on steel tower structures	6	13
350	Fault repair of overhead line apparatus on steel tower structures	6	13
351	Earthing of overhead line transmission conductors	6	15
352	Erection of steel tower structures	6	10
353	Maintain power transformers	6	16
354	Maintain supervisory control and data acquisition (SCADA) systems	6	16
355	Electrical testing of power equipment	6	15
356	Install substation plant and apparatus	6	17



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.

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
- **Qualifications and Credit Framework (QCF):** general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **Events:** dates and information on the latest Centre events
- **Online assessment:** how to register for e-assessments.

Centre Guide – Delivering International Qualifications 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. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

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Useful contacts

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

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City & Guilds

1 Giltspur Street

London EC1A 9DD

www.cityandguilds.com