QUALIFICATION HANDBOOK

Diploma in Electrical Power Engineering - Wind Turbine Installation and Commissioning at SCQF Level 6 (2339-20)

October 2013 Version 1.1

City & Guilds

Qualification at a glance

Subject area	**Utilities**
City & Guilds number	2339
Age group approved	16+
Assessment	Portfolio of evidence
Fast track	Available
Support materials	Qualification handbook
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	SQA reference
SCQF Level 6 in Electrical Power Engineering – Wind Turbine Engineering, Installation and Commissioning	2339-20	R356 04

Version and date	Change detail	Section
1.1 January 2016	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 qualification:

Area	Description
Who is the qualification for?	It is for learners who work or want to work as wind turbine installation technicians in the renewables energy sector
What does the qualification cover?	It allows learners to learn, develop and practise the skills required for employment and/or career progression in the renewable energy sector.
Is the qualification part of a framework or initiative?	It serves as a competency component in the renewable energy Apprenticeship framework.
Who did we develop the qualification with?	It was developed in association with the Renewable Energy Apprenticeships Programme (REAP), comprising Renewable UK, major renewable sector employers, the Sector Skills Council (SSC) and further education colleges.
What opportunities for progression are there?	It allows learners to progress into employment within the renewable energy sector and/or to the following City & Guilds qualifications: • SCQF Level 6 Diploma in Electrical Power Engineering – Wind Turbine Operations and Maintenance. • Further SCQF 6 Diplomas within the suite of Electrical Power Engineering Qualifications. • Appropriate supervisory/management qualifications.

Structure

To achieve the **Diploma in Electrical Power Engineering – Wind Turbine Installation and Commissioning at SCQF 6 (2339-20)**, learners must achieve a minimum of **85** credits, **55** credits from the mandatory units, a minimum of **8** credits from optional group A and a minimum of **22** credits, from optional group B.

City & Guilds unit number	Unit title	Credit value
Mandatory		
Unit 801	Complying with statutory regulations and organisational safety requirements	5
Unit 805	Work with other people	6
Unit 831	Protect the environment during wind turbine maintenance activities	12
Unit 664	Install and check hub, blade and pitch systems and components for wind turbines with internal tower access	14
Unit 665	Install and check yaw system and components for wind turbines with internal tower access	8
Unit 669	Health, safety and welfare in construction and the built environment	10
Optional group A		
Unit 666	Install and check converter systems and components for wind turbines with internal tower access	8
Unit 667	Install and check control systems and components for wind turbines with internal tower access	8
Unit 668	Install and check low voltage systems and components for wind turbines with internal tower access	8
Optional group B		
Unit 642	Configure pitch systems	8

Unit 643	Configure yaw systems	8
Unit 644	Configure control systems	7
Unit 645	Configure converter systems	7

2 Centre requirements

Approval

If your Centre is approved to offer the qualification SCQF Level 5 and 6 Diploma in Electrical Power Engineering - Wind Turbine Operations and Maintenance (2339-16/43) you can apply for the new SCQF Level 6 Diploma in Electrical Power Engineering – Wind Turbine Engineering, Installation and Commissioning qualification approval using the **fast track approval form**, available from the City & Guilds website.

Centres should use the fast track form if:

- there have been no changes to the way the qualifications are delivered, and
- they meet all of the approval criteria in the fast track form guidance notes.

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 this qualification, 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 qualification 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 wind turbine/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, eg 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 this qualification.

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 this qualification. However, centres must ensure that learners have the potential and opportunity to gain the qualification successfully.

There are no restrictions on entry to the diploma, although it is expected that learners will be already engaged within the industry.

Age restrictions

City & Guilds cannot accept any registrations for learners under 16 as this qualification is 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 qualification
- any units they have already completed, or credit they have accumulated which is relevant to the qualification
- 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, their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

Recording documents

Learners 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**.

4 Assessment

Learners must:

- have a completed portfolio of evidence for each unit

Assessment strategy

This section is broken down into the following assessment sub-sections:

- General – provides the overall approach to assessment in the diplomas
- Work-place assessment – description of what is required of the assessment
- Simulation – the criteria and minimum requirements pertaining to this form of assessment
- Realistic working environments – the activities and criteria relating to this form of assessment
- Witness testimony – Sector Skills Council's (SSC) guidance on this form of evidence
- Knowledge & understanding – guidance on the approach to assessing these criteria

General

The 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 are not different from related power sector QCF provision, where evidence to meet the requirements of the standards is gathered by the learner from the work-place and compiled into a portfolio of evidence, which was validated by the approved assessor and internal verifier and subject to City & Guilds' external verification.

The diplomas have been designed to offer choices and progression which recognise learner competence in working as wind turbine installation technicians within respective levels. There may be inter-location variation in the specific items of plant, apparatus and equipment with which learners must interact within each of these contexts. Both learners and assessors therefore must have a detailed knowledge of the specific operational characteristics of the plant, apparatus and equipment with which they work in order to be able to demonstrate, through its use, their achievement of occupational competence as demanded by the units of assessment.

Details of the scope and range of the unit are provided with each unit. In addition to visits from Qualification Consultants (QCs), 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 QC 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 a QC will be planned in advance.

Workplace assessment

It is expected that all evidence of learner performance will be drawn from workplace practice. This evidence must show learners meet the performance criteria consistently in their work, over a period of time. The evidence will also materialise from different workplace situations and be varied in nature - work products, records, discussions as well as observation of, and commentaries on, learner behaviour.
All of the performance and knowledge criteria for each unit must be evidenced, along with the prescribed scope, range and performance requirements.

It is recommended that effective use be made of available opportunities for evidence collection in line with the following principles:

- Evidence must be valid and genuinely produced by or about the learner.
- Evidence from a range of sources will normally be preferable to repeated examples of evidence from a single source - sole use of one type of evidence will need to be justified.
- Assessors should pay due regard to the cost-effectiveness of using varied sources of evidence when planning assessments with a learner.

Simulation

The SSC, 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 wind turbine 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 QC:

- 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.

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 learner performance.

Although it is expected that learners provide all evidence from the workplace, 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 QC**):

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 learners 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. Learners must interact with the range of personnel and contractors found in the normal industry workplace..
6. Learners must be expected to achieve a volume of work comparable to that expected in the normal work situation being replicated.
7. Learners must be given workplace responsibilities that will enable them to meet the requirements of the National Occupational Standards/units of assessment.
8. Learners must show their productivity reflects that found in the work situation being replicated.
9. The RWE must take into account legislation, regulations, codes of practice etc, which pertain to the regulated environment.
10. The RWE must be managed as a real work situation.

Witness testimony:

The SSC supports the use of witness testimony as a natural and efficient way of **contributing** to a learner's source of evidence of competence. Nonetheless, the quality of this type of evidence will be affected by knowledge the witness has about the qualification requirements and their own competence in the occupational role.

As a minimum, witnesses should be:

- fully briefed and clear about the purpose and use of the testimony
- able to demonstrate they have the necessary expertise in the occupational area for which they are providing testimony.

Witnesses should be:

- occupationally competent in the functions covered by the units to which they are contributing. This competence will have been gained by working within the energy and utilities sector
- maintaining their occupational competence by engaging in continuing professional development activities to keep up-to-date with developments and changes taking place within the energy and utilities sector
- working currently, or within the last year, in a post directly related to the qualification units they are witnessing
- familiar with the National Occupational Standards/units of assessment and be able to interpret current working practices and technologies within the area of work
- have had an appropriate induction to the Energy & Utility Skills National Occupational Standards (NOS), the awarding organisation, and assessment centre requirements and have ongoing support by way of access to updating and other issues connected with the qualifications

Knowledge & understanding

The requirement to prove competency is through skills, knowledge and understanding and as such all of the units contain knowledge and understanding criteria that must be evidenced to achieve the full qualification.
Evidencing the knowledge and understanding - the criteria of which are qualified by company policies and procedures; legislation and regulations – can come through natural performance, professional discussion or oral questioning. All knowledge and understanding assessment methods must be recorded along with the learner's answers and/or outcomes - where a component of knowledge and understanding is common across more than one unit, there is no need to assess it independently in relation to each unit.
The use of questioning to probe learner competence in relation to rare or dangerous occurrences should be undertaken only when the use of realistic simulations to address the same competence cannot practically be applied. In all cases, simulation accompanied by oral questioning should be preferred to questioning alone. The use of oral rather than written questioning is recommended to allow assessors the flexibility to investigate those aspects of a learner's knowledge and understanding alongside evaluation of other forms of evidence.

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.

As this qualification is specifically related to the wind, energy and power sector it is not expected that learners will present RPL.

However, and in line with the SSC's assessment strategy, City & Guilds supports the use of other qualifications as valuable contributions to evidence of competence.

Where RPL is sought the centre must first confirm this with the QC or seek advice where there is uncertainty.

5 Units

Availability of units

These units are also available on the Ofqual Register of Regulated Qualifications: **http://register.ofqual.gov.uk**

Structure of units

These units each have the following:

- City & Guilds reference number
- title
- level
- credit value
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- learning outcomes which are comprised of a number of assessment criteria
- notes for guidance.

Unit 801 Complying with statutory regulations and organisational safety requirements

SCQF Level:	5
Credit value:	5
Relationship to NOS:	This unit is linked to EUSWT01
Endorsement by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit covers the skills and knowledge required to deal with statutory regulations and organisational safety requirements. It does not deal with specific safety regulations or detailed requirements, it does, however, cover the more general health and safety requirements that apply to working in an industrial environment.

Learning outcome
The learner will: 1. be able to comply with statutory regulations and organisational safety requirements.
Assessment criteria
The learner can: 1.1 comply with their duties and obligations as defined in the Health and Safety at Work Act 1.2 demonstrate their understanding of their duties and obligations to health and safety by: a. applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act b. identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as: i. eye protection and personal protective equipment (PPE) ii. COSHH regulations iii. risk assessments c. identifying the warning signs and labels of the main groups of hazardous or dangerous substances d. complying with the appropriate statutory regulations at all times 1.3 present themselves in the workplace suitably prepared for the activities to be undertaken 1.4 follow organisational accident and emergency procedures

1.5 comply with emergency requirements, to include:
   a. identifying the appropriate qualified first aiders and the location of first aid facilities
   b. identifying the procedures to be followed in the event of injury to themselves or others
   c. following organisational procedures in the event of fire and the evacuation of premises
   d. identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment

1.6 recognise and control hazards in the workplace

1.7 identify the hazards and risks that are associated with the following:
   a. their working environment
   b. the equipment that they use
   c. materials and substances (where appropriate) that they use
   d. working practices that do not follow laid-down procedures

1.8 use correct manual lifting and carrying techniques

1.9 demonstrate one of the following methods of manual lifting and carrying:
   a. lifting alone
   b. with assistance of others
   c. with mechanical assistance

1.10 apply safe working practices and procedures to include:
   a. maintaining a tidy workplace, with exits and gangways free from obstruction
   b. using equipment safely and only for the purpose intended
   c. observing organisational safety rules, signs and hazard warnings
   d. taking measures to protect others from any harm resulting from the work that they are carrying out.

Learning outcome

The learner will:

2. know how to comply with statutory regulations and organisational safety requirements.

Assessment criteria

The learner can:

2.1 describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act, and other current legislation (such as The 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, Display Screen at Work Regulations, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)

2.2 describe the specific regulations and safe working practices and procedures that apply to their work activities

2.3 describe the warning signs for the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations

2.4	explain how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed
2.5	explain what constitutes a hazard in the workplace (such as moving parts of machinery, electricity, slippery and uneven surfaces, poorly placed equipment, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile, flammable or toxic materials, unshielded processes, working in confined spaces)
2.6	describe their responsibilities for identifying and dealing with hazards and reducing risks in the workplace
2.7	describe the risks associated with their working environment (such as the tools, materials and equipment that they use, spillages of oil, chemicals and other substances, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures)
2.8	describe the processes and procedures that are used to identify and rate the level of risk (such as safety inspections, the use of hazard checklists, carrying out risk assessments, COSHH assessments)
2.9	describe the first aid facilities that exist within their work area and within the organisation in general; the procedures to be followed in the case of accidents involving injury
2.10	explain what constitute dangerous occurrences and hazardous malfunctions, and why these must be reported even if no-one is injured
2.11	describe the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report their presence at the appropriate assembly point
2.12	describe the organisational policy with regard to fire fighting procedures; the common causes of fire and what they can do to help prevent them
2.13	describe the protective clothing and equipment that is available for their areas of activity
2.14	explain how to safely lift and carry loads, and the manual and mechanical aids available
2.15	explain how to prepare and maintain safe working areas; the standards and procedures to ensure good housekeeping
2.16	describe the importance of safe storage of tools, equipment, materials and products
2.17	describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve.

Unit 801 Complying with statutory regulations and organisational safety requirements

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence from the normal work activities that shows they have demonstrated all of the following:
   - Identified sources of information and guidance on health and safety issues such as:
     - personal protective equipment
     - COSHH regulations
     - risk assessments
     - warning signs and labels.
   - Followed accident and emergency procedures such as:
     - identifying first aiders and location of first aid facilities
     - fire/evacuation procedures
     - dangerous occurrences procedures.
   - Recognised and controlled hazards in the work location.
   - Manual lifting and handling either alone, with assistance of others or with mechanical assistance.
   - Applied safe working practices to include:
     - maintaining a tidy workplace
     - using equipment safely
     - observing safety rules
     - observing signs and hazard warnings
     - taking measures to protect others from harm.
2. Evidence should come from performance at work over a period of time.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the learner may be observed carrying out normal work activities and comparing it with the standards to be met
- the assessor may speak to the learner's work colleagues.

Reports and records

- log books, job reports, specifications and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- pictures/photos of work activities.

Written or spoken questioning

- showing they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various safety assessment methods and techniques
- showing that they understand the types of hazards involving processes, tools, equipment and materials
- showing that they understand how to communicate and present the information
- showing that they are aware of the organisational information systems and procedures
- showing that they know the organisational reporting lines and procedures.

Unit 805 Work with other people

SCQF Level:	5
Credit value:	6
Relationship to NOS:	This unit is linked to EUSWT09.
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is about making an effective individual contribution to the work of a team or group. It involves taking an active role, and when necessary a lead role, in providing colleagues with guidance and advice when planning and completing work activities.

Learning outcome
The learner will: 1. be able to perform work with others.
Assessment criteria
The learner can: 1.1 play an active role in determining and agreeing the tasks they and others need to undertake to complete the work activity 1.2 agree what each of you will do and what work methods need to be used to complete tasks before starting the job in accordance with work instructions 1.3 finish the tasks they have been given on schedule and to the required quality standards and in a way that does not interfere with the work being undertaken by others 1.4 share ideas and experiences with colleagues on how improvements can be made to the way work is undertaken and to the quality of the finished product 1.5 collaborate and cooperate with others to find effective ways to deal with work problems 1.6 monitor the status and progress of others' work to establish if and where it interferes with and negatively impacts on theirr own 1.7 follow procedures and precautions to safeguard personnel, plant and the environment in accordance with health and safety regulations, environmental legislation and company procedures 1.8 conduct a risk assessment in accordance with health and safety and environmental legislation.

Learning outcome
The learner will: 2. be able to take a lead role in joint activities.
Assessment criteria
The learner can: 2.1 develop and communication of the work plan 2.2 make sure the work plan specifies the resources required, the objectives to be met, the allocation of responsibilities and the timescale for each aspect of the work 2.3 use and follow the work plan to monitor the progress of the work being undertaken 2.4 follow procedures and precautions designed to safeguard personnel, plant and the environment in accordance with health and safety regulations, environmental legislation and company procedures.

Learning outcome
The learner will: 3. be able to use and communicate data and information.
Assessment criteria
The learner can: 3.1 communicate ideas and information in a clear and concise way 3.2 seek feedback to make sure that ideas, data and information have been communicated and understood by others 3.3 make sure that everyone contributing to the work activity complies with work instructions and quality assurance standards and requirements 3.4 inform the team of the work plan and the work activities they are personally responsible for completing 3.5 communicate the status and progress of the work being undertaken in accordance with company reporting systems and procedures.

Learning outcome
The learner will: 4. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 4.1 report problems outside the limits of personal responsibility to designated personnel 4.2 resolve problems with working relationships 4.3 refer problems with working relationships that cannot be resolved by themself to appropriate personnel.

Learning outcome
The learner will: 5. know and understand how to use general knowledge.
Assessment criteria
The learner can: 5.1 state the main principles of health and safety and environmental legislation and regulations 5.2 state the company reporting lines and authorisation roles and responsibilities 5.3 state the company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 6. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 6.1 demonstrate how to read and interpret procedures and information sources to make sure that tools and equipment are fit for purpose and safe to use 6.2 identify what personal protective equipment needs to be worn when undertaking work activities 6.3 identify what materials and substances are dangerous and hazardous to health 6.4 know how to maintain safe working and environmental practices throughout the duration of the work 6.5 know how to minimise risks to self and others when undertaking work activities 6.6 state company work instruction, information and reporting systems and documentation 6.7 know how to respond to the different types and categories of emergency situations that might occur 6.8 know how to devise deliverable work plans that reflect the skills and competencies of the individual and the work team 6.9 discuss planning methods and techniques 6.10 describe problem solving tools and techniques 6.11 know how to recognise and report incorrect and inaccurate work instructions and supporting documentation in accordance with company.

Unit 805 Work with other people

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. They will need to provide evidence to show that they have worked with other people under all of the following situations:
   - working with one other person
   - working as a member of a team
   - taking a lead role in joint activities.
2. Evidence should come from performance at work over a period of time.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may watch while the learner and their colleagues agree the allocation of work on a job
- the assessor may watch while the learner discusses the progress of their work with a colleague
- the assessor may watch while the learner gives advice and information to a team member to help his/her performance of a given task.

Assessor observation of demonstrations

- the assessor may set up a situation where there is a problem and watch what contribution the learner makes when dealing with it
- the assessor may specifically designate the learner to be the leader of a work team on a set activity and observe how they go about that role.

Reports and records

- work logs showing what they did and when
- work plans they have produced
- memos and other notes written to pass on information and advice to team members
- progress reports they have produced
- risk assessments that they have carried out.

Written or spoken questioning

- showing that they understand the basic principles of work planning
- showing that they understand the importance of good team work and how to achieve it
- showing that they are aware of their own skills and knowledge and those of the people they are working with
- showing that they know what information to exchange with others so that they are all aware of each other's work progress
- showing that they know who to turn to for help if problems arise in working relationships that they cannot deal with themselves.

Unit 831 Protect the environment during wind turbine maintenance activities

SCQF Level:	6
Credit value:	12
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is about minimising risks to life and property in a wind turbine environment and requires that particular care is taken to minimise pollution and physical disturbance and the risk to life.

Learning outcome
The learner will: 1. be able to plan to minimise risk to life, property and the environment.
Assessment criteria
The learner can: 1.1 plan and carry out all work in line with company policy and procedures 1.2 conduct a site specific risk assessment in accordance with company policy and in line with health and safety and environmental regulations.

Learning outcome
The learner will: 2. be able to determine priorities and monitor risk to life, property and the environment.
Assessment criteria
The learner can: 2.1 establish potential hazards and assess the severity of the risk 2.2 prioritise and determine the actions necessary to minimise the risk in agreed timescale 2.3 monitor risk control measures and take corrective and remedial actions to minimise risk 2.4 follow and maintain safe working and environment practices consistent with control measure and in accordance with health and safety regulations and environmental legislation.

Learning outcome
The learner will: 3. be able to restore and reinstate work location.
Assessment criteria
The learner can: 3.1 store tools and equipment on completion of work activity in accordance with company procedures 3.2 dispose of waste materials and hazardous substances in accordance with health and safety and environmental regulations 3.3 leave the work area in a condition that is in line with health and safety regulations and good housekeeping practice.

Learning outcome
The learner will: 4. be able to use and communicate data and information.
Assessment criteria
The learner can: 4.1 provide information necessary to maintain and update safety systems records 4.2 inform those affected by the risk of the risk control measures put in place and clarify the impact and implications that the measures will have on them personally 4.3 read and interpret company work instructions and supporting documentation connected with the work activity.

Learning outcome
The learner will: 5. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 5.1 report problems outside the limits of personal responsibility to designated personnel 5.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 6. know and understand how to use general knowledge.
Assessment criteria
The learner can: 6.1 state the main principles of health and safety and environmental legislation and regulations 6.2 state the company reporting lines and authorisation roles and responsibilities 6.3 state the company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 7. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 7.1 explain how to read and interpret procedures and information sources to make sure that tools and equipment are fit for purpose and safe to use 7.2 explain what personal protective equipment needs to be worn when undertaking work activities 7.3 explain what materials and substances are dangerous and hazardous to health 7.4 explain how to maintain safe working and environmental practices throughout the duration of the work 7.5 explain how to minimise risks to self and others when undertaking work activities 7.6 state company work instruction, information and reporting systems and documentation 7.7 explain how to respond to the different types and categories of emergency situations that might occur 7.8 explain what are the types and application of construction elements 7.9 demonstrate lifting and handling equipment methods and techniques 7.10 explain what are the methods and techniques for dismantling access structures 7.11 explain what type of actions can be taken to minimise risk from hazards 7.12 state how to recognise and report inaccurate and incorrect work instructions and specification documents.

Unit 831 Protect the environment during wind turbine maintenance activities

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. They must provide evidence from their normal work activities that shows they have 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
   - restored and reinstated the work location
   - used and communicated data and information
   - resolved problems effectively and efficiently.
2. Evidence should come from performance at work over a period of time.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner setting up risk control measures and comparing it with the standards to be met
- the assessor may wish to see risk control measures the learner has carried out previously.

Reports and records

- log books, job reports, specifications and other work related documentation that show they have successfully carried out this type of work and when
- any risk assessments carried out previously
- witness testimonies from colleagues and others who understand the requirements of this unit
- pictures/photos of risk control measures in place.

Written or spoken questioning

- showing that they are aware of current heath and safety implications with regard to this work activity
- showing that they understand the various safety assessment methods and techniques
- showing that they understand the types of hazards involving processes, tools, equipment and materials
- showing that they understand how to communicate and present the information
- showing that they are aware of the organisational information systems and procedures
- showing that they know the organisational reporting lines and procedures.

Unit 642 Configure pitch systems

SCQF Level:	6
Credit value:	8
Relationship to NOS:	This unit is linked to EUSWT06
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the configuration of wind turbine pitch systems.

Learning outcome
The learner will: 1. be able to plan to configure pitch systems.
Assessment criteria
The learner can: 1.1 determine the work location using company documentation and work instructions 1.2 conduct a site specific risk assessment in accordance with health and safety regulations 1.3 determine the content and sequence of tasks needed to complete the work activity 1.4 inform parties directly and indirectly responsible for completing the work activity of the work plan 1.5 plan and carry out all work in line with company policy and work procedures.

Learning outcome
The learner will: 2. be able to prepare to configure pitch systems.
Assessment criteria
The learner can: 2.1 inspect, prepare and carry out pre use checks on tools and equipment in accordance with work instructions and equipment specifications 2.2 select and wear required personal protective equipment when completing work activities in accordance with health and safety regulations

2.3	locate and establish the pitch systems to be configured in accordance with authorisation procedures and work instructions.

Learning outcome
The learner will: 3. be able to configure pitch systems.
Assessment criteria
The learner can: 3.1 comply with control measures in line with safe control systems requirements 3.2 follow prescribed setting-up procedures for the equipment to be configured 3.3 configure the system in accordance with work instructions and operating specifications 3.4 check the configured system meets its specified operating parameters and performance requirements 3.5 follow and maintain safe working and environment practices in accordance with health and safety regulations and environmental legislation throughout the duration of the work.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 dispose of waste materials and substances in accordance with company procedures, health and safety and environmental regulations 4.3 leave the work area in a condition which is consistent with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 read and interpret company work instructions and documentation 5.3 report results and findings test activities.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently
Assessment criteria
The learner can: 6.1 deal with problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. know and understand how to use general knowledge.
Assessment criteria
The learner can: 7.1 state the main principles of health and safety and environmental legislation and regulations 7.2 state the company reporting lines and authorisation roles and responsibilities 7.3 state company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the company procedures and processes for reporting problems with tools and equipment 8.2 read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 identify what personal protective equipment needs to be worn when undertaking work activities 8.4 explain how to maintain safe working and environmental practices throughout the duration of the work 8.5 explain how to minimise risks to self and others when undertaking work activities 8.6 identify company work instruction, information and reporting systems and documentation 8.7 explain how to respond to the different types and categories of emergency situations that might occur 8.8 explain how to read, interpret and apply prescribed “setting-up” documentation and procedures for configuring equipment 8.9 recognise and report inaccurate and incorrect work instructions and documentation.

Unit 642 Configure pitch systems

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have configured pitch systems on **three separate occasions**.
2. Configuration may typically need to be carried out when plant characteristics change or replacement components have been fitted.
3. They will need to provide evidence to show that the pitch system operated successfully when configuration had been completed.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner configuring pitch systems, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- calibration/configuration sheets
- operation charts, logs or readouts that confirm the pitch system is working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of pitch systems used and the configuration methods, techniques and procedures
- showing that they understand configuration schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find

Pitch Systems

- Configuration is of pitch systems used within wind turbines.
- Pitch systems can be electrical or hydraulic.
- Pitch systems can be configured stand alone or in sequence with other equipment.
- Pitch systems provide a means to stop a turbine in normal operation and in emergency situations, it is vital this function is tested as part of this unit.

Configuration procedures

Configuration methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All configuration procedures are carried out in compliance with local rules and safety management systems.

Configurations may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being configured. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the configured item matches specifications.

Specification

The specification to be achieved includes details of the quality standards and accuracy needed and may have been set by a manufacturer or the organisation. In the context of this unit, quality and acceptance levels are fully specified and can be readily achieved by following the specified configuration procedures detailed in the company manuals, switching schedules, safety documentation or other such documentation. The specification gives explicit instructions which must be followed.

Unit 643 Configure yaw systems

SCQF Level:	6
Credit value:	8
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the configuration of wind turbine yaw systems.

Learning outcome
The learner will: 1. be able to plan to configure yaw systems.
Assessment criteria
The learner can: 1.1 determine the work location using company documentation and work instructions 1.2 conduct a site specific risk assessment in accordance with health and safety regulations 1.3 determine the content and sequence of tasks needed to complete the work activity 1.4 inform parties directly and indirectly responsible for completing the work activity of the work plan 1.5 plan and carry out all work in line with company policy and work procedures.

Learning outcome
The learner will: 2. be able to prepare to configure yaw systems.
Assessment criteria
The learner can: 2.1 inspect, prepare and carry out pre use checks on tools and equipment in accordance with work instructions and equipment specifications 2.2 select and wear required personal protective equipment when completing work activities in accordance with health and safety regulations 2.3 locate and establish the yaw systems to be configured in accordance with authorisation procedures and work instructions.

Learning outcome
The learner will: 3. be able to configure yaw systems.
Assessment criteria
The learner can: 3.1 comply with control measures in line with safe control systems requirements 3.2 follow prescribed setting-up procedures for the equipment to be configured 3.3 configure system in accordance with work instructions and operating specifications 3.4 check the configured system meets its specified operating parameters and performance requirements 3.5 follow and maintain safe working and environment practices in accordance with health and safety regulations and environmental legislation throughout the duration of the work.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 dispose of waste materials and substances in accordance with company procedures, health and safety and environmental regulations 4.3 leave the work area in a condition which is consistent with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 read and interpret company work instructions and documentation 5.3 report results and findings test activities.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. know and understand how to use general knowledge.
Assessment criteria
The learner can: 7.1 state the main principles of health and safety and environmental legislation and regulations 7.2 state the company reporting lines and authorisation roles and responsibilities 7.3 state company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the company procedures and processes for reporting problems with tools and equipment 8.2 read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 identify what personal protective equipment needs to be worn when undertaking work activities 8.4 explain how to maintain safe working and environmental practices throughout the duration of the work 8.5 explain how to minimise risks to self and others when undertaking work activities 8.6 identify company work instruction, information and reporting systems and documentation 8.7 explain how to respond to the different types and categories of emergency situations that might occur 8.8 explain how to read, interpret and apply prescribed “setting-up” documentation and procedures for configuring equipment 8.9 recognise and report inaccurate and incorrect work instructions and documentation.

Unit 643 Configure yaw systems

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have configured yaw systems on **three separate occasions**.
2. Configuration may typically need to be carried out when plant characteristics change or replacement components have been fitted.
3. They will need to provide evidence to show that the yaw system operated successfully when configuration had been completed.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner configuring yaw systems, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- calibration/configuration sheets
- operation charts, logs or readouts that confirm the yaw system is working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of yaw systems used and the configuration methods, techniques and procedures
- showing that they understand configuration schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Yaw Systems

- Configuration is of yaw systems used within wind turbines.
- Yaw systems can be electrical or mechanical/hydraulic.
- Yaw systems can be configured stand alone or in sequence with other equipment.

Configuration procedures

Configuration methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All configuration procedures are carried out in compliance with local rules and safety management systems.

Configurations may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being configured. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the configured item matches specifications.

Specification

The specification to be achieved includes details of the quality standards and accuracy needed and may have been set by a manufacturer or the organisation. In the context of this unit, quality and acceptance levels are fully specified and can be readily achieved by following the specified configuration procedures detailed in the company manuals, switching schedules, safety documentation or other such documentation. The specification gives explicit instructions which must be followed.

Unit 644 Configure control systems

SCQF Level:	6
Credit value:	7
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the configuration of wind turbine control systems.

Learning outcome
The learner will: 1. be able to plan to configure control systems.
Assessment criteria
The learner can: 1.1 determine the work location using company documentation and work instructions 1.2 conduct a site specific risk assessment in accordance with health and safety regulations 1.3 determine the content and sequence of tasks needed to complete the work activity 1.4 inform parties directly and indirectly responsible for completing the work activity of the work plan 1.5 plan and carry out all work in line with company policy and work procedures.

Learning outcome
The learner will: 2. be able to prepare to configure control systems.
Assessment criteria
The learner can: 2.1 inspect, prepare and carry out pre use checks on tools and equipment in accordance with work instructions and equipment specifications 2.2 select and wear required personal protective equipment when completing work activities in accordance with health and safety regulations 2.3 locate and establish the control system to be configured in accordance with authorisation procedures and work instructions.

Learning outcome
The learner will: 3. be able to configure control systems.
Assessment criteria
The learner can: 3.1 comply with control measures in line with safe control systems requirements 3.2 follow prescribed setting-up procedures for the equipment to be configured 3.3 configure system in accordance with work instructions and operating specifications 3.4 check the configured system meets its specified operating parameters and performance requirements 3.5 follow and maintain safe working and environment practices in accordance with health and safety regulations and environmental legislation throughout the duration of the work.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 dispose of waste materials and substances in accordance with company procedures, health and safety and environmental regulations 4.3 leave the work area in a condition which is consistent with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 read and interpret company work instructions and documentation 5.3 report results and findings test activities.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. know and understand how to use general knowledge.
Assessment criteria
The learner can: 7.1 state the main principles of health and safety and environmental legislation and regulations 7.2 state the company reporting lines and authorisation roles and responsibilities 7.3 state company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the company procedures and processes for reporting problems with tools and equipment 8.2 read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 identify what personal protective equipment needs to be worn when undertaking work activities 8.4 explain how to maintain safe working and environmental practices throughout the duration of the work 8.5 explain how to minimise risks to self and others when undertaking work activities 8.6 identify company work instruction, information and reporting systems and documentation 8.7 explain how to respond to the different types and categories of emergency situations that might occur 8.8 explain how to read, interpret and apply prescribed “setting-up” documentation and procedures for configuring equipment 8.9 recognise and report inaccurate and incorrect work instructions and documentation.

Unit 644 Configure control systems

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have configured control systems on **three separate occasions**.
2. Configuration may typically need to be carried out when plant characteristics change or replacement components have been fitted.
3. They will need to provide evidence to show that the control system operated successfully when configuration had been completed.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner configuring control systems, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- calibration/configuration sheets
- operation charts, logs or readouts that confirm the control system is working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of control systems used and the configuration methods, techniques and procedures
- showing that they understand configuration schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Control Systems

- Configuration is of control systems used within wind turbines.
- Control systems can consist of main system controller with sub controllers, possibly a main controller for overall turbine control with sub controllers for pitch and converter for example they are generally microprocessor/PLC based. The control systems need to interface/communicate together.
- Control systems can be for power factor correction, pitch control, condition monitoring and power output control.
- Control systems can be configured stand alone or in sequence with other equipment.

Configuration procedures

Configuration methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All configuration procedures are carried out in compliance with local rules and safety management systems.

Configurations may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being configured. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the configured item matches specifications.

Specification

The specification to be achieved includes details of the quality standards and accuracy needed and may have been set by a manufacturer or the organisation. In the context of this unit, quality and acceptance levels are fully specified and can be readily achieved by following the specified configuration procedures detailed in the company manuals, switching schedules, safety documentation or other such documentation. The specification gives explicit instructions which must be followed.

Unit 645 Configure converter systems

SCQF Level:	6
Credit value:	7
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the configuration of wind turbine converter systems.

Learning outcome
The learner will: 1. be able to plan to configure convertor systems.
Assessment criteria
The learner can: 1.1 determine the work location using company documentation and work instructions 1.2 conduct a site specific risk assessment in accordance with health and safety regulations 1.3 determine the content and sequence of tasks needed to complete the work activity 1.4 inform parties directly and indirectly responsible for completing the work activity of the work plan 1.5 plan and carry out all work in line with company policy and work procedures.

Learning outcome
The learner will: 2. be able to prepare to configure convertor systems.
Assessment criteria
The learner can: 2.1 inspect, prepare and carry out pre use checks on tools and equipment in accordance with work instructions and equipment specifications 2.2 select and wear required personal protective equipment when completing work activities in accordance with health and safety regulations 2.3 locate and establish the convertor system to be configured in accordance with authorisation procedures and work instructions.

Learning outcome
The learner will: 3. be able to configure convertor systems.
Assessment criteria
The learner can: 3.1 comply with control measures in line with safe control systems requirements 3.2 follow prescribed setting-up procedures for the equipment to be configured 3.3 configure system in accordance with work instructions and operating specifications 3.4 check the configured system meets its specified operating parameters and performance requirements 3.5 follow and maintain safe working and environment practices in accordance with health and safety regulations and environmental legislation throughout the duration of the work.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 dispose of waste materials and substances in accordance with company procedures, health and safety and environmental regulations 4.3 leave the work area in a condition which is consistent with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 read and interpret company work instructions and documentation 5.3 report results and findings test activities.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with problems within the limits of own job role responsibility

6.2	report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. know and understand how to use general knowledge.
Assessment criteria
The learner can: 7.1 state the main principles of health and safety and environmental legislation and regulations 7.2 state the company reporting lines and authorisation roles and responsibilities 7.3 state company policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. know and understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the company procedures and processes for reporting problems with tools and equipment 8.2 read and interpret the procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 identify what personal protective equipment needs to be worn when undertaking work activities 8.4 explain how to maintain safe working and environmental practices throughout the duration of the work 8.5 explain how to minimise risks to self and others when undertaking work activities 8.6 identify company work instruction, information and reporting systems and documentation 8.7 explain how to respond to the different types and categories of emergency situations that might occur 8.8 explain how to read, interpret and apply prescribed “setting-up” documentation and procedures for configuring equipment 8.9 recognise and report inaccurate and incorrect work instructions and documentation.

Unit 645 Configure converter systems

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have configured converter systems on **three separate occasions**.
2. Configuration may typically need to be carried out when plant characteristics change or replacement components have been fitted.
3. They will need to provide evidence to show that the converter system operated successfully when configuration had been completed.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner configuring converter systems, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- calibration/configuration sheets
- operation charts, logs or readouts that confirm the converter system is working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of converter systems used and the configuration methods, techniques and procedures
- showing that they understand configuration schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Converter Systems

- Configuration is of converter systems used within wind turbines.
- They can include elements of AC and/or DC processes and can be configured stand alone or in sequence with other equipment.

Configuration procedures

Configuration methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All configuration procedures are carried out in compliance with local rules and safety management systems.

Configurations may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being configured. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the configured item matches specifications.

Specification

The specification to be achieved includes details of the quality standards and accuracy needed and may have been set by a manufacturer or the organisation. In the context of this unit, quality and acceptance levels are fully specified and can be readily achieved by following the specified configuration procedures detailed in the company manuals, switching schedules, safety documentation or other such documentation. The specification gives explicit instructions which must be followed.

Unit 664 Install and check hub, blade and pitch systems and components for wind turbines with internal tower access

SCQF Level:	6
Credit value:	14
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the installation and checking of hub, blade and pitch systems and components.

Learning outcome
The learner will: 1. be able to plan for installation and checking hub, blade and pitch systems and components.
Assessment criteria
The learner can: 1.1 determine work location using organisational documentation and information sources 1.2 determine the content and sequence of tasks needed to complete the installation of hub, blade and pitch systems and components 1.3 conduct a site specific risk assessment in accordance with health and safety regulations 1.4 plan installation of hub, blade and pitch systems and components in line with organisational policy and procedures.

Learning outcome
The learner will: 2. be able to prepare to install and check hub, blade and pitch systems and components.
Assessment criteria
The learner can: 2.1 prepare tools and equipment in accordance with work instructions and equipment specification 2.2 inform parties directly and indirectly responsible for completing work activity of work plan in accordance with organisational requirements and health and safety regulations 2.3 use the required personal protective equipment for installation of hub, blade and pitch systems and components in accordance with health and safety regulations.

Learning outcome
The learner will: 3. be able to install and check hub, blade and pitch systems and components.
Assessment criteria
The learner can: 3.1 use all relevant information associated with the installation 3.2 install hub, blade and pitch systems and components in accordance with organisational requirements, health and safety regulations and environmental legislation 3.3 use tools, techniques and procedures to confirm the operability of the control system or component in accordance with work instructions 3.4 record confirmation of the control system or component being ready for operation 3.5 maintain a safe working environment during installation and checking of hub, blade and pitch systems and components.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 leave work area in a condition which is in line with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 use organisational work instructions and supporting documentation effectively 5.3 maintain documentation in accordance with organisational requirements 5.4 report outcomes of installation and commissioning work in accordance with organisational requirements 5.5 communicate with relevant organisational delegates in accordance with organisational requirements.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with task specific problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. understand relevant policies and procedures for installation activities.
Assessment criteria
The learner can: 7.1 explain the main principles of health and safety and environmental legislation and regulations in relation to installation of hub, blade and pitch systems and components 7.2 describe organisational reporting lines and authorisation roles and responsibilities 7.3 explain organisational policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the organisational procedures and processes for reporting problems with tools and equipment 8.2 explain the organisational processes, procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 explain the processes and procedures to be followed for inspecting and preparing tools and equipment prior to use 8.4 identify methods of finding information on how to use and maintain fault diagnosis tools and equipment 8.5 state materials and substances which are dangerous and hazardous to health 8.6 describe the measures used to control workplace hazards 8.7 explain processes for maintaining a safe working environment 8.8 describe processes for minimising risks to self and others when undertaking work activities 8.9 describe organisational processes for completing work instructions, information and reporting systems and documentation 8.10 explain processes for responding to different types and categories of emergency situations that might occur 8.11 explain the reasons for using the correct diagnostic tools, techniques and procedures for a given purpose and situation 8.12 explain processes for recognising and reporting issues with work instructions and documentation.

Unit 664 Install and check hub, blade and pitch systems and components for wind turbines with internal tower access

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have installed hub, blade and pitch systems and components on **three separate occasions**. All components must have been installed **at least twice**.
2. Provide evidence to show that following installation they have checked hub, blade and pitch systems and components on **three separate occasions**. All components must have been checked **at least twice**.
3. The installation and subsequent checks must comply with relevant methods, techniques and procedures.

Guidance

Tools that should be used

torque wrench, volt pen, manometer, multi meter, voltage indicating device, proving unit, hand tools, E-plan, hydraulic diagram, laus kit.

Techniques that should be used

mechanical isolations for hub access, electrical isolations, hose tensioning, valve testing, hydraulic pressure and level checks.

Procedures that should be used

permits to work, follow loto procedures, use of work instructions (if applicable), task specific RAMS, dynamic risk assessments.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner installing and checking hub, blade and pitch systems and components, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- installation and component check sheets
- operation charts, logs or readouts that confirm the components are working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of installation and checking; methods, techniques and procedures
- showing that they understand installation schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Installation and checking procedures

Installation methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All installation procedures are carried out in compliance with local rules and safety management systems.

Checking of installed components may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being checked. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the installed components match specifications.

Unit 665 Install and check yaw system and components for wind turbines with internal tower access

SCQF Level:	6
Credit value:	8
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the installation and checking of yaw systems and components.

Learning outcome
The learner will: 1. be able to plan for installation and checking yaw systems and components.
Assessment criteria
The learner can: 1.1 determine work location using organisational documentation and information sources 1.2 determine the content and sequence of tasks needed to complete the installation of yaw systems and components 1.3 conduct a site specific risk assessment in accordance with health and safety regulations 1.4 plan installation of yaw systems and components in line with organisational policy and procedures.

Learning outcome
The learner will: 2. be able to prepare to install and check yaw systems and components.
Assessment criteria
The learner can: 2.1 prepare tools and equipment in accordance with work instructions and equipment specification 2.2 inform parties directly and indirectly responsible for completing work activity of work plan in accordance with organisational requirements and health and safety regulations 2.3 use the required personal protective equipment for installation of yaw systems and components in accordance with health and safety regulations.

Learning outcome
The learner will: 3. be able to install and check yaw systems and components.
Assessment criteria
The learner can: 3.1 use all relevant information associated with the installation 3.2 install yaw systems and components in accordance with organisational requirements, health and safety regulations and environmental legislation 3.3 use tools, techniques and procedures to confirm the operability of the control system or component in accordance with work instructions 3.4 record confirmation of the control system or component being ready for operation 3.5 maintain a safe working environment during installation and checking of yaw systems and components.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 leave work area in a condition which is in line with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 use organisational work instructions and supporting documentation effectively 5.3 maintain documentation in accordance with organisational requirements 5.4 report outcomes of installation and commissioning work in accordance with organisational requirements 5.5 communicate with relevant organisational delegates in accordance with organisational requirements.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with task specific problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. understand relevant policies and procedures for installation activities.
Assessment criteria
The learner can: 7.1 explain the main principles of health and safety and environmental legislation and regulations in relation to installation of yaw systems and components 7.2 describe organisational reporting lines and authorisation roles and responsibilities 7.3 explain organisational policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the organisational procedures and processes for reporting problems with tools and equipment 8.2 explain the organisational processes, procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 explain the processes and procedures to be followed for inspecting and preparing tools and equipment prior to use 8.4 identify methods of finding information on how to use and maintain fault diagnosis tools and equipment 8.5 state materials and substances which are dangerous and hazardous to health 8.6 describe the measures used to control workplace hazards 8.7 explain processes for maintaining a safe working environment 8.8 describe processes for minimising risks to self and others when undertaking work activities 8.9 describe organisational processes for completing work instructions, information and reporting systems and documentation 8.10 explain processes for responding to different types and categories of emergency situations that might occur 8.11 explain the reasons for using the correct diagnostic tools, techniques and procedures for a given purpose and situation 8.12 explain processes for recognising and reporting issues with work instructions and documentation.

Unit 665 Install and check yaw system and components for wind turbines with internal tower access

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

- Provide evidence to show that they have installed yaw systems and components on **three separate occasions**. All components must have been installed **at least twice**.
- Provide evidence to show that following installation they have checked yaw systems and components on **three separate occasions**. All components must have been checked **at least twice**.
- The installation and subsequent checks must comply with relevant methods, techniques and procedures.

Guidance

Tools that should be used

multi meter, voltage indicating device, proving unit, hand tools, E-plan, hydraulic diagram, laus kit, clamp meter.

Techniques that should be used

application of yaw lock (task specific) electrical isolations, uniform power consumption checks, oil level checks, lubrication system checks.

Procedures that should be used

permits to work, follow loto procedures, use of work instructions (if applicable), task specific RAMS, dynamic risk assessments.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner installing and checking yaw systems and components, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- installation and component check sheets
- operation charts, logs or readouts that confirm the components are working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of installation and checking; methods, techniques and procedures
- showing that they understand installation schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Installation and checking procedures

Installation methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All installation procedures are carried out in compliance with local rules and safety management systems.

Checking of installed components may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being checked. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the installed components match specifications.

Unit 666 Install and check converter systems and components for wind turbines with internal tower access

SCQF Level:	6
Credit value:	8
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the installation and checking of converter systems and components.

Learning outcome
The learner will: 1. be able to plan for installation and checking converter systems and components.
Assessment criteria
The learner can: 1.1 determine work location using organisational documentation and information sources 1.2 determine the content and sequence of tasks needed to complete the installation of converter systems and components 1.3 conduct a site specific risk assessment in accordance with health and safety regulations 1.4 plan installation of converter systems and components in line with organisational policy and work procedures.

Learning outcome
2. be able to prepare to install and check converter systems and components.
Assessment criteria
The learner can: 2.1 prepare tools and equipment in accordance with work instructions and equipment specification 2.2 inform parties directly and indirectly responsible for completing work activity of work plan in accordance with organisational requirements and health and safety regulations 2.3 use the required personal protective equipment for installation of converter systems and components in accordance with health and safety regulations.

Learning outcome
The learner will: 3. be able to install and check converter systems and components.
Assessment criteria
The learner can: 3.1 use all relevant information associated with the installation 3.2 install converter systems and components in accordance with organisational requirements, health and safety regulations and environmental legislation 3.3 use tools, techniques and procedures to confirm the operability of the converter system or component in accordance with work instructions 3.4 record confirmation of the converter system and component being ready for operation 3.5 maintain a safe working environment during installation and checking of converter systems and components.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 leave the work area in a condition which is in line with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 use organisational work instructions and supporting documentation effectively 5.3 maintain documentation in accordance with organisational requirements 5.4 report outcomes of installation and commissioning work in accordance with organisational requirements 5.5 communicate with relevant organisational delegates in accordance with organisational requirements.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with task specific problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. understand relevant policies and procedures for installation activities.
Assessment criteria
The learner can: 7.1 explain the main principles of health and safety and environmental legislation and regulations in relation to installation of converter systems and components 7.2 describe organisational reporting lines and authorisation roles and responsibilities 7.3 explain organisational policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the organisational procedures and processes for reporting problems with tools and equipment 8.2 explain the organisational processes, procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 explain the processes and procedures to be followed for inspecting and preparing tools and equipment prior to use 8.4 identify methods of finding information on how to use and maintain fault diagnosis tools and equipment 8.5 state materials and substances which are dangerous and hazardous to health 8.6 describe the measures used to control workplace hazards 8.7 explain processes for maintaining a safe working environment 8.8 describe processes for minimising risks to self and others when undertaking work activities 8.9 describe organisational processes for completing work instructions, information and reporting systems and documentation 8.10 explain processes for responding to different types and categories of emergency situations that might occur 8.11 explain the reasons for using the correct diagnostic tools, techniques and procedures for a given purpose and situation 8.12 explain processes for recognising and reporting issues with work instructions and documentation.

Unit 666 Install and check converter systems and components for wind turbines with internal tower access

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. provide evidence to show that they have installed converter systems and components on **three separate occasions**. All components must have been installed **at least twice**.
2. provide evidence to show that following installation they have checked converter systems and components on **three separate occasions**. All components must have been checked **at least twice**.
3. the installation and subsequent checks must comply with relevant methods, techniques and procedures.

Guidance

Tools that should be used

laptop, software, voltage indicating device, proving unit, key pad/serial cable, laus kit, hand tools.

Techniques that should be used

electrical isolations, updating firmware on grid and generator converters, updating parameters, hardware configuration, converter calibration/tests, fibre optic cable checks, convertor dryness check.

Procedures that should be used

permits to work, follow loto procedures, use of work instructions (if applicable), task specific RAMS, dynamic risk assessments.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner installing and checking converter systems and components, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- installation and component check sheets
- operation charts, logs or readouts that confirm the components are working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of installation and checking; methods, techniques and procedures
- showing that they understand installation schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Installation and checking procedures

Installation methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All installation procedures are carried out in compliance with local rules and safety management systems.

Checking of installed components may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being checked. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the installed components match specifications.

Unit 667 Install and check control systems and components for wind turbines with internal tower access

SCQF Level:	6
Credit value:	8
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the installation and checking of control systems and components.

Learning outcome
The learner will: 1. be able to plan for installation and checking control systems and components.
Assessment criteria
The learner can: 1.1 determine work location using organisational documentation and information sources 1.2 determine the content and sequence of tasks needed to complete the installation of control systems and components 1.3 conduct a site specific risk assessment in accordance with health and safety regulations 1.4 plan installation of control systems and components in line with organisational policy and procedures.

Learning outcome
The learner will: 2. be able to prepare to install and check control systems and components.
Assessment criteria
The learner can: 2.1 prepare tools and equipment in accordance with work instructions and equipment specification 2.2 inform parties directly and indirectly responsible for completing work activity of work plan in accordance with organisational requirements and health and safety regulations 2.3 use the required personal protective equipment for installation of control systems and components in accordance with health and safety regulations.

Learning outcome
The learner will: 3. be able to install and check control systems and components.
Assessment criteria
The learner can: 3.1 use all relevant information associated with the installation 3.2 install control systems and components in accordance with organisational requirements, health and safety regulations and environmental legislation 3.3 use tools, techniques and procedures to confirm the operability of the control system or component in accordance with work instructions 3.4 record confirmation of the control system or component being ready for operation 3.5 maintain a safe working environment during installation and checking of control systems and components.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 leave work area in a condition which is in line with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 use organisational work instructions and supporting documentation effectively 5.3 maintain documentation in accordance with organisational requirements 5.4 report outcomes of installation and commissioning work in accordance with organisational requirements 5.5 communicate with relevant organisational delegates in accordance with organisational requirements.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with task specific problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. understand relevant policies and procedures for installation activities.
Assessment criteria
The learner can: 7.1 explain the main principles of health and safety and environmental legislation and regulations in relation to installation of control systems and components 7.2 describe organisational reporting lines and authorisation roles and responsibilities 7.3 explain organisational policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the organisational procedures and processes for reporting problems with tools and equipment 8.2 explain the organisational processes, procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 explain the processes and procedures to be followed for inspecting and preparing tools and equipment prior to use 8.4 identify methods of finding information on how to use and maintain fault diagnosis tools and equipment 8.5 state materials and substances which are dangerous and hazardous to health 8.6 describe the measures used to control workplace hazards 8.7 explain processes for maintaining a safe working environment 8.8 describe processes for minimising risks to self and others when undertaking work activities 8.9 describe organisational processes for completing work instructions, information and reporting systems and documentation 8.10 explain processes for responding to different types and categories of emergency situations that might occur 8.11 explain the reasons for using the correct diagnostic tools, techniques and procedures for a given purpose and situation 8.12 explain processes for recognising and reporting issues with work instructions and documentation.

Unit 667 Install and check control systems and components for wind turbines with internal tower access

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have installed control systems and components on **three separate occasions**. All components must have been installed **at least twice**.
2. Provide evidence to show that following installation they have checked control systems and components on **three separate occasions**. All components must have been checked **at least twice**.
3. The installation and subsequent checks must comply with relevant methods, techniques and procedures.

Guidance

Tools that should be used

laptop, software, multi meter, voltage indicating device, proving unit, memory stick, com cable, lan cable, hand tools, E-plan, laus kit.

Techniques that should be used

UPS checks, hirschmann update, sticbox update, WTC3 update, comms checks between I/O boards, continuity checks on hand terminal cables, fibre optic cable checks.

Procedures that should be used

permits to work, follow loto procedures, use of work instructions (if applicable), task specific RAMS, dynamic risk assessments.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner installing and checking control systems and components, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- installation and component check sheets
- operation charts, logs or readouts that confirm the components are working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of installation and checking; methods, techniques and procedures
- showing that they understand installation schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Installation and checking procedures

Installation methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All installation procedures are carried out in compliance with local rules and safety management systems.

Checking of installed components may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being checked. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the installed components match specifications.

Unit 668 Install and check low voltage systems and components for wind turbines with internal tower access

SCQF Level:	6
Credit value:	8
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is suitable for learners who are responsible for and have the appropriate level of authority for carrying out the installation and checking of low voltage systems and components. This unit is most likely to be applicable during wind turbine construction and installation. Learners should be complying with recommended methods, techniques and procedures and must report any difficulties which cannot be resolved. Learners must ensure that on completion of the installation the hub, blade and pitch system components are checked against operational requirements. Learners should work safely at all times, complying with health and safety and other relevant regulations and guidelines, keep others informed and complete the relevant documentation.

Learning outcome
The learner will: 1. be able to plan for installation and checking low voltage systems and components.
Assessment criteria
The learner can: 1.1 determine work location using organisational documentation and information sources 1.2 determine the content and sequence of tasks needed to complete the installation of low voltage systems and components 1.3 conduct a site specific risk assessment in accordance with health and safety regulations 1.4 plan installation of low voltage systems and components in line with organisational policy and procedures.

Learning outcome
The learner will: 2. be able to prepare to install and check low voltage systems and components.
Assessment criteria
The learner can: 2.1 prepare tools and equipment in accordance with work instructions and equipment specification 2.2 inform parties directly and indirectly responsible for completing work activity of work plan in accordance with organisational requirements and health and safety regulations 2.3 use the required personal protective equipment for installation of low voltage systems and components in accordance with health and safety regulations.

Learning outcome
The learner will: 3. be able to install and check low voltage systems and components.
Assessment criteria
The learner can: 3.1 use all relevant information associated with the installation 3.2 install low voltage systems and components in accordance with organisational requirements, health and safety regulations and environmental legislation 3.3 use tools, techniques and procedures to confirm the operability of the control system or component in accordance with work instructions 3.4 record confirmation of the control system or component being ready for operation 3.5 maintain a safe working environment during installation and checking of low voltage systems and components.

Learning outcome
The learner will: 4. be able to restore and reinstate work location.
Assessment criteria
The learner can: 4.1 store tools and equipment on completion of the work activity 4.2 leave work area in a condition which is in line with good housekeeping practice.

Learning outcome
The learner will: 5. be able to use and communicate data and information.
Assessment criteria
The learner can: 5.1 report unavailable or defective tools, equipment and resources 5.2 use organisational work instructions and supporting documentation effectively 5.3 maintain documentation in accordance with organisational requirements 5.4 report outcomes of installation and commissioning work in accordance with organisational requirements 5.5 communicate with relevant organisational delegates in accordance with organisational requirements.

Learning outcome
The learner will: 6. be able to resolve problems effectively and efficiently.
Assessment criteria
The learner can: 6.1 deal with task specific problems within the limits of own job role responsibility 6.2 report problems outside job role responsibility to designated personnel.

Learning outcome
The learner will: 7. understand relevant policies and procedures for installation activities.
Assessment criteria
The learner can: 7.1 explain the main principles of health and safety and environmental legislation and regulations in relation to installation of low voltage systems and components 7.2 describe organisational reporting lines and authorisation roles and responsibilities 7.3 explain organisational policies and procedures that directly impact on the work to be undertaken.

Learning outcome
The learner will: 8. understand how to use industry and context specific knowledge.
Assessment criteria
The learner can: 8.1 explain the organisational procedures and processes for reporting problems with tools and equipment 8.2 explain the organisational processes, procedures and information sources used to make sure that tools and equipment are fit for purpose and safe to use 8.3 explain the processes and procedures to be followed for inspecting and preparing tools and equipment prior to use 8.4 identify methods of finding information on how to use and maintain fault diagnosis tools and equipment 8.5 state materials and substances which are dangerous and hazardous to health 8.6 describe the measures used to control workplace hazards 8.7 explain processes for maintaining a safe working environment 8.8 describe processes for minimising risks to self and others when undertaking work activities 8.9 describe organisational processes for completing work instructions, information and reporting systems and documentation 8.10 explain processes for responding to different types and categories of emergency situations that might occur 8.11 explain the reasons for using the correct diagnostic tools, techniques and procedures for a given purpose and situation 8.12 explain processes for recognising and reporting issues with work instructions and documentation.

Unit 668 Install and check low voltage systems and components for wind turbines with internal tower access

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to cover the requirements below:

1. Provide evidence to show that they have installed low voltage systems and components on **three separate occasions**. All components must have been installed **at least twice**.
2. Provide evidence to show that following installation they have checked low voltage systems and components on **three separate occasions**. All components must have been checked **at least twice**.
3. The installation and subsequent checks must comply with relevant methods, techniques and procedures.

Guidance

Tools that should be used

multi meter, voltage indicating device, proving unit, hand tools, E-plan, laus kit.

Techniques that should be used

continuity tests, voltage tests, visual checks.

Procedures that should be used

permits to work, follow loto procedures, use of work instructions (if applicable), task specific RAMS, dynamic risk assessments

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities

- the assessor may observe the learner installing and checking low voltage systems and components, comparing this with the standards to be met.

Reports and records

- log books, job reports and other work related documentation that show they have successfully carried out this type of work and when
- witness testimonies from colleagues and others who understand the requirements of this unit
- installation and component check sheets
- operation charts, logs or readouts that confirm the components are working to the required standards.

Written or spoken questioning

- showing that they are aware of current health and safety implications with regard to this work activity
- showing that they understand the various types of installation and checking; methods, techniques and procedures
- showing that they understand installation schedules and related specifications
- showing that they understand the limits of their personal authority
- showing that they are aware of the possible difficulties and have taken action to reduce them
- showing that they know the procedure to report any difficulties they find.

Installation and checking procedures

Installation methods, techniques and procedures are tightly controlled and fully defined in the specification. The person carrying out the work is responsible for complying with those methods, techniques and procedures and must report any difficulties which cannot be resolved through their use. All installation procedures are carried out in compliance with local rules and safety management systems.

Checking of installed components may be relatively simple or complex to achieve. In all cases the standard to be reached is clearly identified in the specification for the item of plant, apparatus or equipment being checked. The person carrying out this role is responsible for ensuring that the required standard is achieved and that the installed components match specifications.

Unit 669 Health, safety and welfare in construction and the built environment

SCQF Level:	6
Credit value:	10
Assessment requirements specified by a sector or regulatory body:	This unit is endorsed by EU Skills.
Aim:	This unit is about health, safety and welfare in a wind turbine construction environment.

Learning outcome
The learner will: 1. know the responsibilities of employers and employees under current health, safety and welfare legislation.
Assessment criteria
The learner can: 1.1 outline the roles and responsibilities of people assigned specific health and safety duties at work 1.2 outline the legal duties of employees and employers in relation to three pieces of health, safety and welfare legislation relevant to the construction and built environment sector.

Learning outcome
The learner will: 2. know how to undertake risk assessments using appropriate principles and formats.
Assessment criteria
The learner can: 2.1 describe how to identify the hazards present in a given workplace situation, the people who may be at risk, and the possible consequences 2.2 describe the main principles and features of a typical risk assessment for a given workplace situation.

Learning outcome
The learner will: 3. understand the control measures used to reduce risk and meet legal requirements.
Assessment criteria
The learner can: 3.1 select control measures for a given workplace situation to reduce risks and meet legal requirements, using workplace health and safety policies.

Learning outcome
The learner will: 4. know their own role in accident recording and reporting procedures.
Assessment criteria
The learner can: 4.1 describe the role of the individual in accident recording and reporting procedures.

Unit 669 Health, safety and welfare in construction and the built environment

Supporting information

Evidence requirements

The learner needs to provide evidence to show that the way they work matches the National Standard. To do this they will need to provide evidence to cover the requirements below:

1. Know the responsibilities of employers and employees under current health, safety and welfare legislation.
2. Know how to undertake risk assessments using appropriate principles and formats.
3. Understand the control measures used to reduce risk and meet legal requirements.
4. Know their own role in accident recording and reporting procedures.

Examples of evidence

Evidence can come in several different forms. The assessor and the learner will need to decide what evidence it would be best for them to provide in their particular circumstances. Here are a few examples:

Assessor observation of work activities and written or spoken questioning

- The assessor may observe the learner setting up risk control measures and comparing it with the standards to be met.
- The assessor may wish to see risk control measures they have carried out previously.
- The assessor may ask questions to test the learner's knowledge.
- The assessor may give the learner a pre-set knowledge test paper to complete.

Reports and records

- log books, job reports, specifications and other work related documentation that show they have the knowledge to successfully carry out this type of work
- any risk assessments carried out previously
- any near hit/near miss report forms
- any accident report forms
- witness testimonies from colleagues and others who understand the requirements of this unit
- pictures/photos of risk control measures in place.

Appendix 1 Relationships to other qualifications

Links to other qualifications

This qualification has connections to:

- SCQF Level 6 Diploma in Electrical Power Engineering – Wind Turbine Operations and Maintenance.
- Further SCQF 6 Diplomas within the suite of Electrical Power Engineering Qualifications.
- Appropriate supervisory/management qualifications.

Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see **www.cityandguilds.com/functionalskills**
- Essential Skills (Northern Ireland) – see **www.cityandguilds.com/essentialskillsni**
- Essential Skills Wales – see **www.cityandguilds.com/esw**

Appendix 2 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 learners
- 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 learners who are eligible for adjustments in assessment.

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

- **Walled Garden:** how to register and certificate learners online

- **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.

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www.cityandguilds.com

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 Group

The City & Guilds Group is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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