

# Level 2 Diploma in Electrical Power Engineering - Power Plant Operations (2339-15)

**501/0002/6**

## Unit Pack



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# 1 About this document

This document contains the unit titles, accreditation numbers and content for the:

- Level 2 Diploma in Electrical Power Engineering – Power Plant Operations (2339-15) 501/0002/6.

The qualification, an NVQ attesting to work-place competence, has been developed by City & Guilds in conjunction with power sector employers and the sector skills council Energy & Utility Skills (EU Skills).

Learners must achieve a total of 95 credits to achieve the Level 2 Diploma in Electrical Power Engineering – Power Plant Operations (2339-15), made up of the following:

- 11 credits from Mandatory Unit Group A (301 and 305)
- 40 credits from Mandatory Unit Group B (348 and 349), plus
- a minimum of 44 credits, **from at least 4 units**, from Optional Group C (320, 350-355).

All of the performance criteria must be evidenced.

For standardisation, and where appropriate, the performance and knowledge assessment criteria are:

- prescribed with range, scope and evidence requirements
- qualified by company policies and procedures; legislation and regulations

This qualification is delivered in line with the requirements of EU Skills' assessment strategy (captured in the main qualification handbook) and in the same fashion as a national vocational qualification (NVQ). In the case of unit 301 the evidence must be produced in line with SEMTA's Assessment Strategy.

Title and level	GLH	TQT	City & Guilds number	Accreditation number
Level 2 Diploma in Electrical Power Engineering - Power Plant Operations	537	950	2339-15	501/0002/6

## 2 Units

The units in this qualification are written in a standard format and comprise the following:

- Title
- City & Guilds reference number
- Unit Accreditation Number (UAN)
- Level
- Credit value
- Learning outcomes which are comprised of a number of assessment criteria
- Information on assessment

Unit accreditation number	City & Guilds unit	Level	Title	Credit	GLH
<b>Mandatory Group A</b>					
A/601/5013	301	2	Complying with statutory regulations and organisational safety requirements	5	35
T/600/5595	305	2	Work with other people	6	36
<b>Mandatory Group B</b>					
A/600/5355	348	2	Operating an electricity generation system	20	120
L/600/5358	349	2	Evaluate and solve problems associated with an electricity generation system	20	120
<b>Optional Group C</b>					
A/600/5663	320	2	Develop yourself in the work role	6	36
Y/600/5363	350	2	Handover and accept responsibility for the operation of an electricity generation system	17	90
T/600/5371	351	2	Assist the remote operation of an electricity generation unit	20	120
J/600/5374	352	2	Prepare an electricity generation system for service	12	60
D/600/5963	353	2	Isolate and de-isolate an electricity generation system	14	70
T/600/6049	354	2	Routine testing of an electricity generating system	12	60
K/600/6081	355	2	Coordinate a response to a systems contingency	20	120

## Total Qualification Time

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a Learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Title and level	GLH	TQT
Level 2 Diploma in Electrical Power Engineering - Power Plant Operations	537	950

## Unit 301                    Complying with statutory regulations and organisational safety requirements

<b>UAN:</b>	A/601/5013
<b>Level:</b>	2
<b>Credit value:</b>	5
<b>GLH:</b>	35

This unit covers the skills and knowledge needed to prove the competences 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.

The learner will be expected to comply with all relevant regulations that apply to their area of work, as well as their general responsibilities as defined in the Health and Safety at Work Act. The learner will need to be able to identify the relevant qualified first aiders and know the location of the first aid facilities. The learner will have a knowledge and understanding of the procedures to be adopted in the case of accidents involving injury and in situations where there are dangerous occurrences or hazardous malfunctions of equipment, processes or machinery. The learner will also need to be fully conversant with their organisation's procedures for fire alerts and the evacuation of premises.

The learner will also be required to identify the hazards and risks associated with their job. Typically, these will focus on their working environment, the tools and equipment that they use, the materials and substances that they use, any working practices that do not follow laid-down procedures, and manual lifting and carrying techniques.

**Outcome 1:** Comply with statutory regulations and organisational safety requirements

- 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:
  - applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act
  - identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as:
    - eye protection and Personal Protective Equipment (PPE)
    - COSHH regulations
    - risk assessments
  - identifying the warning signs and labels of the main groups of hazardous or dangerous substances
  - 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:
  - identifying the appropriate qualified first aiders and the location of first aid facilities
  - identifying the procedures to be followed in the event of injury to themselves or others
  - following organisational procedures in the event of fire and the evacuation of premises
  - 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:
  - their working environment
  - the equipment that they use
  - materials and substances (where appropriate) that they use
  - 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:
  - lifting alone
  - with assistance of others
  - with mechanical assistance
- 1.10 Apply safe working practices and procedures to include:
  - maintaining a tidy workplace, with exits and gangways free from obstruction
  - using equipment safely and only for the purpose intended
  - observing organisational safety rules, signs and hazard warnings
  - taking measures to protect others from any harm resulting from the work that they are carrying out

**Outcome 2:** Know how to comply with statutory regulations and organisational safety requirements

- 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

<b>UAN:</b>	T/600/5595
<b>Level:</b>	2
<b>Credit value:</b>	6
<b>GLH:</b>	36

This unit is about making an effective individual contribution to the work of a team or group. It involves taking an active role and where necessary a lead role in providing colleagues with guidance and advice when planning and completing work activities. It also involves using and communicating data and information and resolving problems.

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

- perform work with others
- take a lead role in joint activities
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas:

#### Outcome 1: Perform work with others

- 1.1 Play an active role in determining and agreeing the tasks you 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 you 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 your 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

**Outcome 2:** Take a lead role in joint activities

- 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

**Outcome 3:** Use and communicate data and information

- 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

**Outcome 4:** Resolve problems effectively and efficiently

- 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 yourself to appropriate personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 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 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 procedures

**Additional information about the unit**

Scope and range: evidence needs to show that the learner has **worked with other people** under **all** the **following situations**:

- a) Working with one other person
- b) Working as a member of a team
- c) Taking a lead role in joint activities

<b>UAN:</b>	A/600/5663
<b>Level:</b>	2
<b>Credit value:</b>	6
<b>GLH:</b>	36

This unit is about playing an active role in reviewing and setting objectives to improve your personal performance. It involves using self assessment methods so that you can establish and agree with line management how to achieve your development objectives.

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

- develop yourself in the work role
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas:

#### Outcome 1: Develop yourself in the work role

- 1.1 Assess your current levels of competence and establish where areas of personal development are needed
- 1.2 Agree, with input of your supervisor, the period of time and resources you need to achieve the personal development objectives
- 1.3 Devise and agree a personal development plan, including deadlines, with the support of your supervisor
- 1.4 Implement, with the support of your supervisor, your personal development plan
- 1.5 Review progress against meeting the objectives of your personal development plan and decide on future development actions
- 1.6 Actively seek feedback and advice from your supervisor and work colleagues on how you can maintain and improve your level of performance

### Knowledge and Understanding

To perform effectively in this unit, you need to have evidence in the following areas

#### Outcome 2: Know and understand how to use general knowledge

- 2.1 State the main principles of health and safety and environmental legislation and regulations
- 2.2 State the company reporting lines and authorisation roles and responsibilities
- 2.3 State the company policies and procedures that directly impact on the work to be undertaken

#### Outcome 3: Know and understand how to use industry and context specific knowledge

- 3.1 Understand where to find training and development opportunities to support personal development plans and objectives
- 3.2 Describe self assessment processes and techniques
- 3.3 Know how to build personal development plans
- 3.4 Know how to write personal development objectives

**Additional information about the unit**

Scope and range: evidence needs to show that the learner has :

- a) played an active role in reviewing and developing yourself in the work role, whilst demonstrating that you understand the techniques and processes involved
- b) actively sought feedback and guidance from sources such as; line management, personnel or training specialists, colleagues in your work team
- c) participated in work role development activities by providing records of; courses, competence assessment, personal development plans, certificates.

<b>UAN:</b>	A/600/5355
<b>Level:</b>	2
<b>Credit value:</b>	20
<b>GLH:</b>	120

This unit is designed to ensure that operatives operating a local engineering system, under direction, do so in a manner that ensures it functions within its normal operating parameters at all times. It also involves using and communicating data and information and resolving problems.

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

- change the operational status of a system
- control a system under instruction
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas:

#### Outcome 1: Change the operational status of a system

- 1.1 Determine the system condition is safe and ready for status change before taking action
- 1.2 Follow a prescribed sequence of actions to carry out status changes in accordance with work instructions
- 1.3 Maintain system parameters within specified limits throughout status change process
- 1.4 Make status changes on schedule and in accordance with work instructions

#### Outcome 2: Control a system under instruction

- 2.1 Monitor the system to make sure it is operating within its predetermined operating parameters
- 2.2 Report the system parameters to designated personnel in accordance with work schedules
- 2.3 Follow and comply with operational directives
- 2.4 Determine when the system control calls for an intervention and adjustment that are you are authorised to make
- 2.5 Execute system control actions to minimise the oscillation in parameters
- 2.6 Take action to preserve safety in the event of a contingency

#### Outcome 3: Use and communicate data and information

- 3.1 Communicate to designated personnel when a system intervention and adjustments are outside own responsibility to initiate
- 3.2 Maintain and update records of system operation in accordance with work schedule
- 3.3 Read and interpret company instructions and supporting documentation

**Outcome 4:** Resolve problems effectively and efficiently

- 4.1 Deal with problems within the limits of own job role responsibility
- 4.2 Report problems outside job role responsibility to designated personnel

### **Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 6.1 Identify what personal protective equipment needs to be worn when undertaking work activities
- 6.2 Explain how to minimise risks to self and others when undertaking work activities
- 6.3 State company work instruction, information and reporting systems and documentation
- 6.4 Describe how to respond to the different types and categories of emergency situations that might occur
- 6.5 State what the significance is of parameter indicators
- 6.6 Identify what communication system to use to report on system parameters
- 6.7 Identify what adjustments to make in area of own responsibility without having to refer back to the appropriate person
- 6.8 State why it is important to make control changes as smooth as possible
- 6.9 Describe what sorts of difficulties you could meet which need to be reported to an appropriate person
- 6.10 Describe how to recognise and respond to contingencies
- 6.11 State why it is important to observe safety precautions and follow safe procedures at all times
- 6.12 State what operational information is recorded

### **Additional information about the unit**

Scope and range: evidence needs to show that the learner has **changed the operational status** and **controlled two different systems** under instruction on the following occasions:

- a) Taken two systems off-line
- b) Brought two systems on-line
- c) Controlled two systems under instruction

<b>UAN:</b>	L/600/5358
<b>Level:</b>	2
<b>Credit value:</b>	20
<b>GLH:</b>	120

This unit is about evaluating and solving technical problems affecting the operation and function of systems and equipment. It involves gathering, collating and assessing information relating to the nature and extent of problems and formulating and implementing plans to resolve them.

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

- assess and evaluate information
- investigate the extent of the problem
- resolve problems and prevent future incidents
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 1:** Assess and evaluate information

- 1.1 Make an assessment of the range of information needed to deal with the problem
- 1.2 Determine the information sources to be used to evaluate the problem
- 1.3 Obtain pre-determined and selected sources of information to evaluate problem
- 1.4 Assess the validity, reliability and significance of the information obtained
- 1.5 Search for alternative sources when the information is inadequate or conflicting
- 1.6 Follow procedures and precautions designed to safeguard personnel, plant and the environment

#### **Outcome 2:** Investigate the extent of the problem

- 2.1 Use pre-determined information sources to investigate the problem
- 2.2 Establish the nature and extent of the problem
- 2.3 Determine incidences where the same or similar problems have occurred
- 2.4 Draw valid conclusions in the light of available information
- 2.5 Assess the consequences and impact of the problem

- 2.6 Assess the implications and impact of the problem on maintenance priorities
- 2.7 Evaluate the hazards posed by the problem

**Outcome 3:** Resolve problems and prevent future incidents

- 3.1 Coordinate resources to investigate the problem
- 3.2 Determine how to deal with the problem in the light of the prevailing situation
- 3.3 Initiate the actions needed to deal with the problem with an urgency appropriate to its significance
- 3.4 Coordinate actions to make sure the problem is dealt with according to plan
- 3.5 Evaluate actions taken to establish if the problem has been resolved
- 3.6 Follow procedures and precautions designed to safeguard personnel, plant and the environment

**Outcome 4:** Use and communicate data and information

- 4.1 Record, organise and store information in accordance with company reporting and documentation systems and procedures
- 4.2 Communicate the results of the investigation and actions taken to resolve the problem
- 4.3 Maintain communications with those that provide information relating to the problem

**Outcome 5:** Resolve problems effectively and efficiently

- 5.1 Deal with problems within the limits of own job role responsibility
- 5.2 Report problems outside job role responsibility to designated personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 6:** Know and understand how to use general knowledge

- 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

**Outcome 7:** Know and understand how to use industry and context specific knowledge

- 7.1 State why it is important to communicate concisely and accurately
- 7.2 Explain how to minimise risks to self and others when undertaking work activities
- 7.3 State how to communicate and record the findings of problem evaluation and actions taken to resolve problems
- 7.4 State the basic principles of the electricity systems, sub-systems and equipment
- 7.5 State how to methodically evaluate and resolve problems using problem solving techniques and processes
- 7.6 State what information sources are available to support the problem evaluation and problem solving process
- 7.7 Confirm how to judge if information used to evaluate problems is valid, reliable and significant

## Additional information about the unit

Scope and range: evidence needs to show that the learner has **evaluated and solved three different types of problem** from the following list:

- a) Control failure and significant deviations from the norm
- b) Indication failures
- c) Communication failures
- d) Alarm malfunctions
- e) Plant malfunctions
- f) External influences
- g) Loss of plant security

<b>UAN:</b>	Y/600/5363
<b>Level:</b>	2
<b>Credit value:</b>	17
<b>GLH:</b>	90

This unit is designed to ensure that operatives can handover and accept responsibility for the operation of an electricity generation system whilst maintaining its integrity during the transfer. It also involves using and communicating data and information and resolving problems.

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

- prepare for the handover of a system
- handover responsibility for operation of a system
- accept responsibility for operation of a system
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 1:** Prepare for the handover of a system

- 1.1 Determine the information that needs to be communicated to designated personnel prior to the handover
- 1.2 Determine the operating status of the generation unit in line with operating parameters

#### **Outcome 2:** Handover responsibility for operation of a system

- 2.1 Maintain system, plant and apparatus parameters under control during handover
- 2.2 Provide information on all recent events, parameters and status affecting systems, plant and apparatus
- 2.3 Follow procedures and precautions designed to safeguard personnel, plant and the environment

#### **Outcome 3:** Accept responsibility for operation of a system

- 3.1 Obtain all the written and verbal information you require to accept responsibility
- 3.2 Confirm the accuracy and completeness of the information provided prior to accepting responsibility

- 3.3 Ensure that you correctly understand the plant and system parameters and situation
- 3.4 Provide information and support outgoing person to minimise and avoid disruption to operations during the handover

**Outcome 4:** Use and communicate data and information

- 4.1 Ensure that all records are complete and up to date
- 4.2 Communicate written and verbal information on the status of unit and system to the incoming/outgoing person before leaving the workstation
- 4.3 Give the incoming and outgoing person the opportunity to ask questions and make sure that they fully understand the situation
- 4.4 Obtain confirmation that the handover has been accepted
- 4.5 Read and interpret company work instructions and supporting documentation
- 4.6 Provide designated personnel with personal contact details on completing handover
- 4.7 Actively seek out any additional information and clarification if any aspects of the situation are unclear

**Outcome 5:** Resolve problems effectively and efficiently

- 5.1 Deal with problems within the limits of own job role responsibility
- 5.2 Report problems outside job role responsibility to designated personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 6:** Know and understand how to use general knowledge

- 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

**Outcome 7:** Know and understand how to use industry and context specific knowledge

- 7.1 Confirm what sort of information needs to be communicated at handover and why
- 7.2 State why it is important to communicate concisely and accurately
- 7.3 Explain how to minimise risks to self and others when undertaking work activities
- 7.4 State company work instruction, information and reporting systems and documentation
- 7.5 Explain how to respond to the different types and categories of emergency situations that might occur
- 7.6 Explain why it is your responsibility to allow others to clarify and confirm their understanding of the situation
- 7.7 Confirm who has responsibility for maintaining systems during handover
- 7.8 Confirm what organisational requirements typically exist in relation to the process of a shift handover
- 7.9 Confirm what records need to be kept
- 7.10 Explain why it is important that the transfer of responsibility is accepted by the oncoming person before you leave the area
- 7.11 Identify what support might be needed to maintain systems during handover
- 7.12 Confirm who needs to know about the contact details of the oncoming person and how should these be relayed

- 7.13 State what organisational requirements typically exist in relation to the process of a shift handover
- 7.14 Describe the basic principles of the electricity generation process
- 7.15 Demonstrate an understanding of system operating principles

#### **Additional information about the unit**

Scope and range: evidence needs to show that the learner has handed **over and accepted** responsibility of a system on the following occasions:

- a) Handed over responsibility for a system when conditions are stable
- b) Handed over responsibility for a system when conditions are dynamic
- c) Handed over responsibility for a system when there is an ongoing problem which has not been solved at the time of handover
- d) Accepted responsibility for a system when conditions are stable
- e) Accepted responsibility for a system when conditions are dynamic
- f) Accepted responsibility for a system when there is an ongoing problem which has not been solved at the time of handover

<b>UAN:</b>	T/600/5371
<b>Level:</b>	2
<b>Credit value:</b>	20
<b>GLH:</b>	120

This unit is designed to ensure that operatives assisting with the remote operation of the unit whilst under the direction of the operator do so in a manner that ensures it functions within its normal operating parameters at all times. It also involves monitoring system operating parameters and responding to emergencies if called upon using and communicating data and information and resolving problems.

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

- monitoring the operation of a system
- perform remote control actions on a system
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 1:** Monitoring the operation of a system

- 1.1 Interpret data and information indicating the condition and status of the system against unit operation parameters
- 1.2 Conduct systems checks in accordance with operation procedures
- 1.3 Make sure that incoming data is logged

#### **Outcome 2:** Perform remote control actions on a system

- 2.1 Act on operational instructions given to you by authorised personnel
- 2.2 Follow operating procedures and sequences of actions when carrying out control actions in accordance with work instructions
- 2.3 Check the system is operating within its operating parameters as a result of control actions taken
- 2.4 Respond to unit alarms in accordance with work instructions and safety procedures
- 2.5 Take action to preserve safety from system hazards and inherent dangers in the event of a contingency

- 2.6 Follow procedures and precautions designed to safeguard personnel, plant and the environment

**Outcome 3:** Use and communicate data and information

- 3.1 Maintain and record data and information on the status of the system
- 3.2 Communicate the status and condition of the system to authorised and designated personnel
- 3.3 Report on the effects of control actions taken

**Outcome 4:** Resolve problems effectively and efficiently

- 4.1 Deal with problems within the limits of own job role responsibility
- 4.2 Report problems outside job role responsibility to designated personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 6.1 Confirm what procedures you have to comply with to do your job
- 6.2 State the operating context and constraints which apply
- 6.3 Confirm what system parameters exist and how to maintain them
- 6.4 Confirm why it is important to confirm the state of the systems
- 6.5 Describe what sorts of operational difficulties you may encounter and how to deal with them
- 6.6 Identify what human and material resources are needed when starting up and shutting down a system
- 6.7 Describe operational principles of plant, apparatus and associated equipment in the system
- 6.8 Effective communication
- 6.9 State what parameters exist for individual systems and the unit
- 6.10 State health, safety and environmental safety practices in relation to electricity generation in an industrial environment
- 6.11 Explain how to use and interpret technical data
- 6.12 State how to maintain plant parameters
- 6.13 Explain what sorts of contingencies can arise and how to deal with them
- 6.14 State plant and equipment operating procedures and parameters
- 6.15 State what system parameters should be expected and used to compare against actual data
- 6.16 Explain how to confirm the validity of data by cross checking with data from other sources
- 6.17 Describe operational principles of plant and apparatus associated with the electricity generating units
- 6.18 Confirm what system parameters should be expected and used to compare against actual data
- 6.19 Confirm what procedures and forms are used for data logging
- 6.20 State what data is logged
- 6.21 Explain why it is important to follow the prescribed timetable of checks

- 6.22 Explain what the layout is of the systems you work on, including where parameter indicators are to be found
- 6.23 Confirm why it is important to check system parameters when carrying out control actions
- 6.24 Confirm what the significance is of parameter indicators and alarms
- 6.25 Explain when an emergency shutdown is necessary and how to do it
- 6.26 Describe the role of different systems in the electricity generation process

#### **Additional information about the unit**

Scope and range: evidence needs to show that the learner has **monitored system data** and **carried out control actions whilst under supervision** on **two different** systems.

- a) Monitor data from two systems for a minimum period of two operational shifts
- b) Carry out control actions on two systems

**UAN:** J/600/5374

**Level:** 2

**Credit value:** 12

**GLH:** 60

This unit is about preparing a generation system for direct service or standby, using and communicating data and information and resolving problems.

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

- prepare a system for service
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 1:** Prepare a system for service

- 1.1 Plan and carry out all work activities in line with company policy and procedures
- 1.2 Make sure that the safety documents have been cancelled and that the system is de-isolated and is fit for service
- 1.3 Prepare the system for services in accordance with safety procedures and work instructions
- 1.4 Complete service preparation work in accordance with the timescale needed
- 1.5 Take actions to deal with defects, contingencies and abnormalities
- 1.6 Follow and maintain safe working and environment practices in accordance with health and safety regulations and environmental legislation

#### **Outcome 2:** Use and communicate data and information

- 2.1 Read and interpret company work instructions and supporting documentation
- 2.2 Report that the system is ready for service
- 2.3 Read and interpret remote working operation work procedures and documentation
- 2.4 Maintain records in accordance with company reporting systems and documentation

#### **Outcome 3:** Resolve problems effectively and efficiently

- 3.1 Deal with problems within the limits of own job role responsibility
- 3.2 Report problems outside job role responsibility to designated personnel

### **Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 4:** Know and understand how to use general knowledge

- 4.1 State the main principles of health and safety and environmental legislation and regulations
- 4.2 State the company reporting lines and authorisation roles and responsibilities
- 4.3 State the company policies and procedures that directly impact on the work to be undertaken

#### **Outcome 5:** Know and understand how to use industry and context specific knowledge

- 5.1 Confirm safety rules and regulations, company policies and procedures to be followed when preparing a system for service
- 5.2 Confirm processes and procedures for reporting and resolving problems
- 5.3 Explain how to read and interpret work instruction, quality assurance procedures and documentation
- 5.4 Identify what personal protective equipment needs to worn when undertaking work activities
- 5.5 Explain how to respond to the different types and categories of emergency situations that can occur
- 5.6 Confirm plant and equipment operating procedures and parameters
- 5.7 State company work instruction, information and reporting systems and documentation
- 5.8 State how to recognise and report inaccurate and incorrect work instructions and documentation

### **Additional information about the unit**

Scope and range: evidence needs to show that the learner has **prepared two different systems for service**.

- a) Prepare two systems for service for either immediate operation or for standby

<b>UAN:</b>	D/600/5963
<b>Level:</b>	2
<b>Credit value:</b>	14
<b>GLH:</b>	70

This unit is about the isolation and de-isolation of a plant system or part of a system. It involves following schedules and procedures, using and communicating data and information and resolving problems.

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

- isolating a system
- de-isolating a system
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### **Performance Criteria**

To perform effectively in this unit, you need to have evidence in the following areas:

#### **Outcome 1:** Isolating a system

- 1.1 Determine with authorised personnel the extent of the isolation work activity to be undertaken
- 1.2 Make sure that plant and apparatus has been released from service
- 1.3 Seek clarification from designated personnel regarding abnormal or unusual isolation requirements
- 1.4 Apply isolation points to guard against system hazards and inherent dangers
- 1.5 Discharge and release energy and substances stored in components and systems
- 1.6 Carry out the correct tests to check and confirm that the applied isolations are adequate
- 1.7 Take prompt and appropriate action to preserve safety from system hazards and inherent dangers in the event of a contingency

**Outcome 2:** De-isolating a system

- 2.1 Before starting the process get confirmation from an authorised person that the system is ready to de-isolate
- 2.2 Inspect the plant to be de-isolated
- 2.3 Make an assessment of whether de-isolation can go ahead, given the environmental conditions and state of the plant
- 2.4 Complete the de-isolation on schedule
- 2.5 Return isolation devices to the correct storage location after removal
- 2.6 Take prompt and appropriate action to preserve safety from system hazards and inherent dangers in the event of a contingency

**Outcome 3:** Use and communicate data and information

- 3.1 Report problems experienced when carrying out intended isolation or de-isolation of system
- 3.2 Communicate the state of the plant following the isolation or de-isolation clearly and effectively
- 3.3 Accurately record the applied isolation and de-isolation

**Outcome 4:** Resolve problems effectively and efficiently

- 4.1 Follow procedures and precautions designed to safeguard personnel, plant and the environment
- 4.2 Take action to prevent and protect the operation of the system in accordance with unit operating procedures and parameters
- 4.3 Report problems outside the limits of personal responsibility to designated personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 6.1 Confirm who is authorised to issue isolation requirements
- 6.2 State in what ways could plant configuration not be compatible with an intended isolation
- 6.3 Confirm how to read and follow instructions
- 6.4 Identify what the different methods are of electrical and mechanical isolations
- 6.5 State why it is important to report any problems promptly
- 6.6 Explain why stored energy and fluids must be discharged safely
- 6.7 State why testing is carried out to confirm an isolation
- 6.8 Confirm what information on isolation status needs to be communicated and to whom
- 6.9 Explain what sorts of contingencies can arise and how to deal with them safely
- 6.10 State why it is important to follow safety precautions and procedures

- 6.11 Describe operational principles of plant, apparatus and associated equipment in the system
- 6.12 State limits of responsibility of individuals and others for dealing with problems
- 6.13 Explain how to use and interpret technical data
- 6.14 State isolation methods and their uses
- 6.15 Explain why it is important to get clearance to carry out de-isolation and who is authorised to give that
- 6.16 Explain what you should look for when inspecting plant to be de-isolated
- 6.17 Confirm what factors in the environment or in the state of the plant would indicate that de-isolation could not be carried out safely
- 6.18 State what sort of difficulties can arise with a de-isolation
- 6.19 State why you should report difficulties and to whom
- 6.20 Identify where isolation devices are kept and what procedures to follow to record their return

### **Additional information about the unit**

Scope and range: evidence needs to show that the learner has **isolated and de-isolated two different systems** or significant parts of systems:

- a) Isolated two systems or significant parts of systems
- b) De-isolated two systems or significant parts of systems
- c) Applied both mechanical and electrical isolations
- d) Removed both mechanical and electrical isolations

## Unit 354

# Routine testing of an electricity generating system

<b>UAN:</b>	T/600/6049
<b>Level:</b>	2
<b>Credit value:</b>	12
<b>GLH:</b>	60

This unit is about preparing for and carrying out routine testing on generating systems, plant and equipment. It also involves using and communicating data and information and resolving problems.

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

- prepare to conduct routine tests on a system
- conduct routine tests on a system
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas:

#### Outcome 1: Prepare to conduct routine tests on a system

- 1.1 Obtain and follow unit procedures for conducting routine tests
- 1.2 Select and check that the testing equipment is fit for purpose in accordance with work instructions
- 1.3 Obtain and follow unit procedures for conducting routine tests

#### Outcome 2: Conduct routine tests on a system

- 2.1 Carry out tests in accordance with work instructions
- 2.2 Carry out tests in specified sequence in accordance with work instructions
- 2.3 Report test result that are outside normal operating parameters
- 2.4 Safeguard the health and safety of unit personnel in accordance with health and safety rules and regulations
- 2.5 Complete routine testing activities on schedule

#### Outcome 3: Use and communicate data and information

- 3.1 Report unacceptable test results to designated personnel

- 3.2 Report when the system is returned to its specified state in accordance with the units operation requirements
- 3.3 Advise designated and authorised personnel when routine testing is complete
- 3.4 Maintain and update records of system operation in accordance with work schedule

**Outcome 4:** Resolve problems effectively and efficiently

- 4.1 Deal with problems within the limits of own job role responsibility
- 4.2 Report problems outside the limits of your responsibility to designated personnel

### **Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 6.1 Identify what personal protective equipment needs to worn when undertaking work activities
- 6.2 Explain how to minimise risks to self and others when undertaking work activities
- 6.3 State company work instruction, information and reporting systems and documentation
- 6.4 Explain how to respond to the different types and categories of emergency situations that might occur
- 6.5 State what the significance is of parameter indicators
- 6.6 Describe what sorts of difficulties you could meet which need to be reported to an appropriate person
- 6.7 Explain how to recognise and respond to contingencies
- 6.8 State why it is important to observe safety precautions and follow safe procedures at all times
- 6.9 Identify what sources of technical information on system data, limits and constraints to use when testing
- 6.10 Explain why you need to tell the person in charge when there is a problem with the system.
- 6.11 Describe what types of defects and abnormalities can arise and what kinds of test results do they produce
- 6.12 Explain the layout of plant, apparatus and associated equipment, including the location and significance of plant parameter indications
- 6.13 Explain why it is important to follow safety precautions and procedures designed to maintain safety when testing systems
- 6.14 State what the system condition needs to be before routine testing can commence.
- 6.15 State what operational information is recorded
- 6.16 State what sources of technical information on system data, limits and constraints to use when conducting routine testing work

## Additional information about the unit

Scope and range: evidence needs to show that the learner has **carried out routine testing on two different** systems:

- a) Carry out routine testing of two systems
- b) On one occasion when unit/system is on line
- c) On one occasion when unit/system is off line

<b>UAN:</b>	K/600/6081
<b>Level:</b>	2
<b>Credit value:</b>	20
<b>GLH:</b>	120

This unit is about the coordination and response to a contingency situation. It involves being able to identify a contingency situation and coordinating the actions and responses of others to bring the situation under control. It also involves using and communicating data and information and resolving problems.

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

- initiate a response to a contingency
- coordinate a response to contingency
- use and communicate data and information
- resolve problems effectively and efficiently
- know and understand how to use general knowledge
- know and understand how to use industry and context specific knowledge.

### Performance Criteria

To perform effectively in this unit, you need to have evidence in the following areas:

#### Outcome 1: Initiate a response to a contingency

- 1.1 Respond promptly to unit alarms
- 1.2 Recognise signs of a contingency as the situation develops
- 1.3 Make use of system information when deciding the response to a contingency
- 1.4 Decide and determine the actions that are needed to deal with the contingency
- 1.5 Carry out response within the limits of your own personal responsibility and in accordance with health and safety rules and regulations
- 1.6 Take action to preserve safety of self and others in the event of a contingency in accordance with health and safety regulations and procedures
- 1.7 Provide directions to others on the actions they need to take in the event of a contingency
- 1.8 Plan and carry out all activities in accordance with company policies and procedures

**Outcome 2:** Coordinate a response to contingency

- 2.1 Obtain and interpret systems information to monitor the impact the contingency is having on the unit and its operation
- 2.2 Gauge the effectiveness of the response
- 2.3 Assess the situation to make sure that response is technically valid
- 2.4 Monitor and adjust actions when required to increase the effectiveness of the response to a contingency
- 2.5 Provide directions and information to those directly and indirectly involved in responding to the contingency
- 2.6 Make sure the location of those involved in responding to the contingency is known to you

**Outcome 3:** Use and communicate data and information

- 3.1 Record the contingency and the actions taken to respond to it to designated and authorised personnel

**Outcome 4:** Resolve problems effectively and efficiently

- 4.1 Deal with problems within the limits of own job role responsibility
- 4.2 Report problems outside the limits of your personal responsibility to designated personnel

**Knowledge and Understanding**

To perform effectively in this unit, you need to have evidence in the following areas:

**Outcome 5:** Know and understand how to use general knowledge

- 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

**Outcome 6:** Know and understand how to use industry and context specific knowledge

- 6.1 State the company procedures and processes for reporting problems with tools and equipment
- 6.2 Identify what personal protective equipment needs to be worn when undertaking work activities
- 6.3 Describe how to maintain safe working and environmental practices throughout the duration of the work
- 6.4 Explain how to minimise risks to self and others when undertaking work activities
- 6.5 Explain what the layout is of the system, including where system controls are to be found
- 6.6 Explain how to respond to the different types and categories of emergency situations that might occur
- 6.7 Explain why it is important to give others clear and accurate directions; what information do they need to carry out the actions asked of them
- 6.8 Describe what factors should be taken into account when deciding if a response is effective or not
- 6.9 State what others need to be told in order for them to respond to a contingency effectively
- 6.10 Identify what the layouts are of the systems within the unit
- 6.11 State the protocols to follow to determine what actions to take in response to a contingency

- 6.12 Confirm who is responsible for what actions in the control room and on the plant
- 6.13 Describe what sorts of contingencies can arise and how to deal with them, including when an emergency shut-down of the unit is necessary

**Additional information about the unit**

Scope and range: evidence needs to show that the learner has **initiated and coordinated the response to three different contingencies** taken from the following list:

- a. System/equipment malfunction or failure
- b. Unpredicted operational deviations
- c. High risk of fire or explosion
- d. External influences and safety
- e. Environmental influences

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