QUALIFICATION SPECIFICATION

ECITB Diploma in Maintaining Plant and Systems – Instrumentation and Controls at SCQF Level 7

SQA Accreditation group award number: R835 04

Contents

1. Introduction

Objective and overview

The Engineering Construction Industry Training Board (ECITB) is the employer-led skills, standards, and qualifications body for the development of the engineering construction workforce of Great Britain. An arms-length body of the UK Government, the ECITB reports directly to the Department for Education.

The ECITB Awarding Body for accredited engineering construction qualifications is part of the industry training board. Our qualifications certify knowledge and competence across craft and technical disciplines. They improve quality and standards for the industry, helping engineering construction companies to stay competitive.

This document is for use by Approved Centres and their candidates. It is also used by ECITB's External Quality Assurers. It may also be of interest to employers and training providers.

The ECITB Diploma in Maintaining Plant and Systems – Instrumentation and Controls at SCQF Level 7 is a work-based qualification based on the National Occupational Standards (NOS) for the Engineering Construction industry. The qualification comprises both knowledge and competence. NOS are developed by employers and professional bodies in conjunction with the ECITB Standard Setting Organisation and describe what employers mean by occupational competence within a particular job role.

The objectives of this qualification are to:

Prepare candidates for employment in the maintaining plant and systems in the instrumentation and controls industry.

Support candidates working in the maintaining of plant and systems in the instrumentation and controls industry.

Enable candidates to progress to higher levels, including opportunities to move to supervisory and managerial roles.

Maintenance Technician Occupations

Maintenance technicians maintain the safety, integrity and effective operation of plant and systems in a wide range of industries of national importance including power generation and water infrastructure, petrochemical, oil and gas, and steel, food and drink processing.

Maintenance technicians are responsible for the assembly, installation, maintenance, inspection, repair and testing of a wide range of plant and associated components. They diagnose the causes of malfunctions or failures of operational equipment in a prompt and efficient manner, resolving problems quickly. They also undertake preventative maintenance in order to prevent failure. Maintenance technicians interpret maintenance schedules, specifications, engineering drawings and diagrams and understand on-site hazards and the statutory health, safety and environmental requirements of maintaining plant and systems.

Maintenance technicians are overseen by a supervisor. They are responsible for the quality of their own work, and possibly that of others, and for ensuring work is completed safely and effectively, following procedures and completing essential documentation at all times. They work on various types of plant and systems depending on their company sector and typically specialise in one of the following: electrical, instrumentation and control or mechanical.

Entry requirements

There are no mandatory entry requirements for this qualification. The qualification is open to any candidate who the Approved Centre believes can reach the assessment requirements

set out within this document. A candidate must have a sound grasp of the English language and mathematics to be able to follow instructions as well as complete the learning and assessment required for this qualification. The Approved Centre will work with prospective candidates and, where appropriate, employers, to determine a candidate's suitability for the qualification.

Language

This qualification is available in English only. For candidates who use English as a second language, an Approved Centre must satisfy itself prior to registering a candidate that the candidate's level of English is sufficient to be able to access the learning and undertake the assessment at the appropriate level, and to be able to interact with others and work safely.

Achievement

This qualification consists of 13 mandatory units. A candidate must successfully meet the requirements in each of the units in order to attain this qualification. This document details the learning outcomes and assessment criteria that a candidate must meet in order to demonstrate the acquisition of the knowledge and skills needed to be awarded an Diploma in Maintaining Plant and Systems – Instrumentation and Controls at SCQF Level 7. Mandatory observation of the candidate by an Approved Centre assessor is required to achieve this qualification.

The contents of each unit within the qualification interrelate and the AB issues credit certificates for completion of stand-alone units, on request from the Approved Centre. The qualification contains the following units:

ECITB unit number	SQA Accreditation unit number	Unit title	SCQF level	SCQF Credit
ECITBCO-S1	UT09 04	Contribute to effective working relationships in engineering construction	5	6
ECITBCO-S2	UT55 04	Work safely and minimise risk in engineering construction	6	10
ECITBCO-S4	UT56 04	Work with environmental sustainability in mind	6	6
ECITBCO-S5	UT23 04	Interpret and follow documentation and procedures	6	6
ECITBCO-S6	UT54 04	Use digital technology and information effectively and securely	5	2
MPSI&C-01S	UT31 04	Position and install engineering construction instrument and controls in engineering construction plant	7	12
MPSI&C-02S	UT16 04	Disassemble instrumentation and control equipment and systems in engineering construction	7	10
MPSI&C-03S	UT02 04	Carry out preventative and corrective maintenance on instrumentation and control equipment and systems in engineering construction plant	7	12
MPSI&C-05S	UT39 04	Remove and replace instrumentation and control components from equipment and systems in engineering construction	6	12

MPSI&C-09S	US98 04	Assemble components of instrument and control systems in engineering construction	7	16
MPSI&C-010S	UT42 04	Repair instrumentation and control equipment and systems in engineering construction plant	7	9
MPSI&C-013S	UT50 04	Test instrumentation and control equipment and systems in engineering construction plant	8	13
MPSI&C-016S	UT13 04	Diagnose faults in instrumentation and control equipment and systems in engineering construction	8	13

Credit and level

Credit is a value attached to each unit and each qualification, based on the amount of time it would take the average candidate to achieve and demonstrate the learning outcomes of a qualification. In practice, individual candidate requirements and individual delivery methods mean there will be variation in the actual time taken to complete a qualification. Credit are estimates, based on consultation with industry practitioners, supervisors, and assessors. One credit point is equivalent to 10 hours. Credit includes:

- Formal input, e.g. contact time with tutor, acquisition of knowledge/understanding. Off the job time.
- Additional activities, e.g. developing practice, reflection, research/study time. On the job time.
- Assessment, e.g. planning, completion of assessment tasks.

This qualification has 1237 credit points.

The credit points allow candidates, learning providers and employers to compare the size of different qualifications.

In some instances, it may be possible to transfer SCQF credit points to and from other learning programmes This will enable a candidate to include evidence of prior knowledge and competence and to ensure they do not repeat learning previously undertaken.

Universities, colleges, SQA Accreditation and other awarding bodies decide how many of the credit points received from previous learning can be transferred into their programmes. In all cases of credit transfer, it would be the decision of the accepting learning provider as to how many credit points could be transferred. Please refer to the *ECITB Recognition of Prior Learning Policy and Procedures*.

Time limits on the process of credit accumulation or exemptions are set out for each unit within the qualification structure.

This qualification is at SCQF Level 7. The SCQF descriptor for Level 7 is:

Characteristic 1: **Knowledge and understanding**
Demonstrate and/or work with: An appreciation of the body of knowledge that constitutes a subject/discipline/sector. A range of knowledge, facts, theories, ideas, properties, materials, terminology, practices, and techniques about, and associated with, a subject/discipline/sector. Relating the subject/discipline/sector to a range of practical and/or commonplace applications.
Characteristic 2: **Practice: Applied knowledge, skills and understanding**
Apply knowledge, skills and understanding: In known, practical contexts. In using some of the basic, routine practices, techniques and/or materials associated with the subject/discipline/sector. In exercising these in routine contexts that may have non-routine elements. In planning how skills will be used to address set situations and/or problems and adapt these as necessary.
Characteristic 3: **Generic cognitive skills**
Obtain, organise, and use factual, theoretical and/or hypothetical information in problem solving. Make generalisations and predictions. Draw conclusions and suggest solutions.
Characteristic 4: **Communication, ICT, and numeracy skills**
Use a wide range of skills, for example: Produce and respond to detailed and relatively complex written and oral communication in both familiar and unfamiliar contexts. Select and use standard ICT applications to process, obtain and combine information. Use a wide range of numerical and graphical data in routine contexts which may have non-routine elements.
Characteristic 5: **Autonomy, accountability and working with others**
Take responsibility for carrying out a range of activities where the overall goal is clear, under non-directive supervision. Exercise some supervisory responsibility for the work of others and lead established teams in the implementation of routine work within a defined and supervised structure. Manage limited resources within defined and supervised areas of work.

Take account of roles and responsibilities related to the tasks being carried out and take a significant role in the evaluation of work and the improvement of practices and processes.

Equity, diversity and inclusion

We have designed this qualification and its assessments to enable fair access to all candidates as far as reasonably possible, while taking industry requirements into consideration, e.g. health and safety.

You may wish to refer to our *Equal Opportunities Policy* and the *Reasonable Adjustments and Special Considerations Policy and Procedure* that are published on the ECITB website.

If you would like to discuss arrangements for reasonable adjustments, please contact us at qualifications@ecitb.org.uk.

Progression

Completing this qualification can lead to a range of further career options. Those who wish to stay in engineering construction can develop their skills further, or progress through supervision to senior positions such as Construction Manager. Individuals can progress through additional qualifications and apprenticeships or into supporting engineering functions such as technical leadership, procurement, quality assurance, project management or project controls.

2. Qualification units and scope of assessment

2.1 Unit features

This qualification consists of 13 mandatory units. Candidates must attain all the learning outcomes in each unit to gain a Pass in the qualification. Candidates attain a learning outcome by meeting each of the assessment criteria linked to the learning outcome at the appropriate standard. The units in this specification show the assessment criteria that a candidate must meet to attain the learning outcomes.

The qualification grade available is Pass.

Each unit has the following sections:

ECITB unit number
The unique unit code that identifies the unit on ECITB's system.
SQA Accreditation unit number
The unique unit code that the regulator (SQA Accreditation) uses to identify the unit.
Unit title
The name of the unit, which reflects the content of the unit.
SCQF level
These levels measure the degree of challenge posed by the qualification compared to other qualifications. The levels are determined by using the SCQF and EQF level descriptors.
Credit value
The credit value represents the learning time being defined as the time taken by candidates at the level of the unit, on average, to complete the learning outcomes of the unit to the standard determined by the assessment criteria.
Unit aim
A summary of what the unit enables the candidate to do.
Learning outcomes
What a candidate will know, understand and/or be able to do upon attainment of the unit. Each learning outcome starts with the letters LO.
Assessment criteria
The requirements a candidate is expected to meet to demonstrate the attainment of the related learning outcome. Each assessment criterion starts with the letter K if it relates to knowledge or understanding and with the letter S if it relates to skills. Each assessment criterion starts with a command verb which instructs the candidate in what to do.
Assessment
This section outlines how the unit will be assessed.
Standards
The National Occupational Standard(s) that the unit is mapped to.

2.2 Underpinning knowledge and skills

Units ECITBCO-S1 to ECITBCO-S6 detail the factual, procedural and theoretical knowledge that the candidate must acquire and also demonstrate on plant, equipment and systems of their selected discipline:

- Relevant national and industry health, safety and environmental standards and legislation and those relevant to the specific disciplines, as appropriate.
- Site safety responsibilities, own and others including: first aid procedures, evacuation procedures and contingency reporting.
- Types and effects of hazards, safety assessment methods and techniques and how to minimise associated risks.
- Relationships: importance of understanding of work relationship problems.
- Lines of communication, reporting lines and levels of responsibility in the workplace.

- The importance of ethical working and the sustainable use of resources including: codes of conduct, minimising the impact of work on the environment.
- The importance of questioning and demonstrating initiative in day-to-day problem solving.
- Procedures and related documentation and responsibility for reporting and following procedures.
- Preparation and reinstatement of the work area including: preparing, checking and handling material; types of equipment and the related care and control procedures; storing and disposing of material; handing over plant and equipment.

2.3 Plant and systems specific knowledge and skills

Units MPSI&C-01S to MPSI&C-16S are discipline specific and the candidate must demonstrate their application of knowledge and skills on structures, plant and equipment.

The candidate is required to effectively demonstrate the theoretical, factual and procedural knowledge and practical skills of the following units that comprise the qualification in accordance with the stated assessment criteria and scope of assessment provided in this document:

ECITBCO-S1	Contribute to effective working relationships in engineering construction
ECITBCO-S2	Work safely and minimise risk in engineering construction
ECITBCO-S4	Work with environmental sustainability in mind
ECITBCO-S5	Interpret and follow documentation and procedures
ECITBCO-S6	Use digital technology and information effectively and securely
MPSI&C-01S	Position and install instrumentation and control equipment and systems in engineering construction plant
MPSI&C-02S	Disassemble instrumentation and control equipment and systems in engineering construction
MPSI&C-03S	Carry out preventative and corrective maintenance on instrumentation and control equipment and systems in engineering construction plant
MPSI&C-05S	Remove and replace instrumentation and control components from equipment and systems in engineering construction
MPSI&C-09S	Assemble instrumentation and control equipment and systems in engineering construction
MPSI&C-10S	Repair instrumentation and control equipment and systems in engineering construction plant
MPSI&C-13S	Test instrumentation and control equipment and systems in engineering construction plant
MPSI&C-16S	Diagnose faults in instrumentation and control equipment and systems in engineering construction

2.3 Further information

For further information either visit the ECITB website or contact the ECITB Awarding Body:

Office F15, Kings House Business Centre, Home Park Estate
Station Road, Kings Langley, WD4 8LZ
Email: Qualifications@ecitb.org.uk
Website: www.ecitb.org.uk

2.4 Units

ECITB unit:	**ECITBCO-S1 Contribute to effective working relationships in engineering construction**
SQA Accreditation unit code: UT09 04	
SCQF level: 5 **Credit value:** 6	

Unit purpose and aim: This unit has been designed to assess learner competence in being able to:

1. Establish and maintain productive working relationships
2. Deal with disagreements in an amicable and constructive way so that good relationships are maintained
3. Keep others informed about work plans or activities which affect them
4. Seek assistance from others in a polite and courteous way without causing undue disruption to normal work activities
5. Respond in a timely and positive way when others ask for help or information

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from ECITB/ECRS 11.04 (CO 1)

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand lines of communication and responsibilities	K1.1 Explain the individual's responsibilities and the responsibilities of others within the work location
	K1.2 Describe the lines of communication that exist within the individual's working environment and explain the agreed procedure for passing information

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO2 Understand the importance of creating and maintaining working relationships	K2.1 Describe the individual's responsibilities for creating and maintaining working relationships and explain why it is important to do so
LO3 Understand problems affecting relationships	K3.1 Describe different problems that can affect relationships, and the actions that can be taken to deal with specific difficulties
LO4 Establish and maintain productive working relationships	S4.1 Develop working relationships with different people in the work environment such as: those for whom they are responsible, those to whom they are responsible, clients, colleagues, other tradespersons, suppliers, security/safety personnel
LO5 Deal with disagreements in an amicable and constructive way so that effective relationships are maintained	S5.1 Respond in a positive way when others ask for help or information
	S5.2 Treat everyone fairly and with respect and support the creation of a welcoming and inclusive environment for everyone
	S5.3 Maintain effective relationships by: a. Resolving disagreements in a constructive and objective manner b. Escalating if needed c. Reporting, in accordance with procedures
LO6 Seek assistance from others in a polite and courteous way without causing undue disruption to normal working activities	S6.1 Maintain effective relationships by seeking assistance from others in a polite and courteous manner
LO7 Respond in a timely and positive way when others ask for help or information	S7.1 Follow relevant work or professional codes of conduct, as appropriate for their role
	S7.2 Requests for help and information to identify exactly what is required
	S7.3 Resolve problems within the limits of their authority as they arise

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment. Such methods may include discussions about product evidence and questioning. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**ECITBCO-S2 Work safely and minimise risk in engineering construction**
SQA Accreditation unit code: UT55 04	
SCQF level: 6 **Credit value:** 10	

Unit purpose and aim: This unit has been designed to assess learner competence in being able to:

1. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
2. Call for expert help in the event of contingencies occurring, using warning systems as appropriate
3. Take prompt and appropriate action to minimise risk of personal and third-party injury as a first priority and then damage to property and equipment
4. Follow shutdown and evacuation procedures promptly and correctly
5. Deal safely with dangers that can be contained using appropriate equipment and materials, in accordance with organisational policy and procedures

In the context of this unit, responsibility is limited to working within an overall risk control strategy which has been developed by safety specialists and which includes detailed criteria for identifying risks together with clearly defined procedures for action which must be followed. In some cases, the learner may be expected to refer to others for final authorisations, even though they remain responsible for identifying and implementing decisions.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from ECITB/ECRS 10.06 (CO 2), NOS ECITB (C0 4)

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K1.1 Explain the requirements of health and safety legislation

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.2 Explain the consequences for employers and employees of not fulfilling their legal health and safety responsibilities
	K1.3 Explain the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.4 Manage hazards and the associated risk and their responsibility in relation to dealing with and reporting hazards including what risks there are in relation to health and safety
LO2 Understand personal site safety responsibilities	K2.1 Demonstrate how to recognise health and safety training needs, the procedure for requesting training and who to ask for help in understanding the work instructions
	K2.2 Explain how to get information relating to the safe use of equipment and how to ensure the equipment is used safely
	K2.3 Demonstrate how to recognise when personal protective equipment should be used and how to select and use the correct equipment for the work to be undertaken
	K2.4 Explain different types of vibration injuries and explain how they can be prevented
	K2.5 Explain the importance of personal behaviour in maintaining workplace standards
	K2.6 Demonstrate the checks which are needed to make sure that portable electrical appliances are safe to use
	K2.7 Demonstrate what a safe system for electrical isolation should include and why low voltage is generally safer in relation to health and safety
	K2.8 Explain the risks from overhead cables and how to control them
	K2.9 Demonstrate what must be done when carrying hazardous substances in vehicles

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K2.10 Explain where asbestos is likely to be found, what should be done if it is thought to have been found and how it is a risk to health
LO3 Understand others' site safety responsibilities	K3.1 Explain who is responsible for ensuring that equipment is checked and safe to use
	K3.2 Explain the need for health and safety training for themself and others in a workplace and the procedures for requesting training
	K3.3 Explain the consequences for employers and employees of not fulfilling their legal health and safety responsibilities
LO4 Demonstrate first aid procedures	S4.1 Follow relevant first aid procedures that typically relate to the workplace
	S4.2 Demonstrate where information, competent assistance and local first aid facilities can be obtained
LO5 Understand and follow evacuation procedures	S5.1 Follow relevant evacuation procedures that typically apply in the workplace
	S5.2 Demonstrate where information and competent assistance for evacuation can be obtained
LO6 Follow contingency reporting procedures	S6.1 Complete contingency reporting documentation following relevant systems to workplace activities
LO7 Follow appropriate reporting lines and procedures	S7.1 Comply with the various reporting lines and procedures that apply in the working environment

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from discussions with candidates about work-based activities on suitable engineering construction industry sites

	or realistic workplace environment. Such methods may include discussions about product evidence and questioning. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**ECITBCO-S4 Work with environmental sustainability in mind**
SQA Accreditation unit code: UT56 04	
SCQF level: 6 **Credit value:** 6	

Unit purpose and aim: This unit has been designed to assess learner competence in being able to:

1. Explain how to establish and maintain environmental sustainability
2. Explain how to deal with environmental considerations
3. Explain how to keep others informed about environmental plans or activities which affect them
4. Describe how to minimise use of resources and production of waste materials
5. Understand how to store re-usable materials and dispose of waste materials
6. Explain how to report environmental information, improvements, concerns or incidents

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from ECITB/ECRS 11.04 (CO 5)

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Work in a way that contributes to environmental sustainability	K1.1 Describe how to reduce impact on the environment by following environmentally safe working practices and taking precautions to minimise environmental damage
LO2 Understand the move towards a net zero future, in accordance with their organisation's policies and targets	K2.1 Explain how to deal effectively with resources taking environmental considerations into account
	K2.2 Describe how to minimise use of resources, where possible
	K2.3 Describe how to minimise the production of waste wherever and however possible

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K2.4 Explain the correct disposal of waste materials
	K2.5 Explain how to store re-usable materials and equipment in accordance with procedures
LO3 Understand reporting lines and responsibility	K3.1 Report any environmental incidents, concerns or improvements that are identified

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from discussions with candidates about work-based activities on suitable engineering construction industry sites or realistic workplace environment. Such methods may include discussions about product evidence and questioning. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**ECITBCO-S5 Interpret and follow documentation and procedures**
SQA Accreditation unit code: UT23 04	
SCQF level: 6 **Credit value:** 6	

Unit purpose and aim: This unit has been designed to assess learner competence in being able to:

1. Interpret and follow documented procedures
2. Understand the principles of documentation
3. Understand the principles of quality control
4. Understand the principles of legal documentation
5. Understand the conventions of documentation and information communication
6. Understand the hazards arising from tools and equipment

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from ECITB/ECRS 11.04 (CO 1)

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Interpret and follow documentation and procedures	K1.1 Check the revisions, date and validity of documentation
	K1.2 Check the revisions, date and validity of documentation
	K1.3 Interpret equipment manuals, relevant plans and schedules
	K1.4 Follow authorization procedures, quality procedures and related documentation
	K1.5 Complete all relevant documentation correctly

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K1.6 Report defects or variations and any instance where the activity cannot be met
	K1.7 Check that all required actions are completed, and reports are finished
	K1.8 Follow appropriate handover procedures
	K1.9 Follow safety procedures, risk assessments and methods of work
	K1.10 Reinstate the work area, materials, tools and equipment
LO2 Understand the principles and conventions of documentation	K2.1 Explain the principles, uses and conventions of engineering drawings
	K2.2 Describe the relevance of worksheets, technical drawings and related specifications
	K2.3 Describe the relationship between details and diagrams in engineering drawings and specifications
	K2.4 Explain the diagrams and key information in catalogues and equipment manuals
	K2.5 Describe the sources of manufacturer or additional relevant information
	K2.6 Explain the use of plans and schedules
	K2.7 Describe procedures and authorisations of related to tasks undertaken
	K2.8 Describe quality control and documentation procedures
	K2.9 Describe the importance of checking and confirming procedures and documentation
	K2.10 Describe the importance of signing legal documentation and the consequences accountabilities
	K2.11 Describe reporting of tasks undertaken

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K2.12 Explain actions to take in the event of variations to the plan of work
	K2.13 Describe reporting lines and procedures
LO3 Understand the hazards arising from tools and equipment	K3.1 Describe the hazards that can arise from preparing work materials, tools and equipment
	K3.2 Describe the hazards that can arise from reinstating work materials, tools and equipment

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from discussions with candidates about work-based activities on suitable engineering construction industry sites or realistic workplace environment. Such methods may include discussions about product evidence and questioning. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**ECITBCO-S6 Use digital technology and information effectively and securely**
SQA Accreditation unit code: UT54 04	
SCQF level: 5 **Credit value:** 2	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to interpret and use basic digital information and technology securely.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from ECITB/ECRS 11.04 (CO 1)

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Have a knowledge of basic digital information and technology	K1.1 Demonstrate awareness of the need for security of digital data and technology use in the workplace, the reasons for and importance of this, including relevant legal aspects
	K1.2 Describe simple permission levels related to data access
	K1.3 Demonstrate awareness of the requirement of passwords in data security and how to manage passwords effectively, as appropriate for their role
	K1.4 Describe how to use software and digital systems necessary for their role
	K1.5 Describe how to use digital technology and equipment necessary for their role

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K1.6 Demonstrate awareness of how to handle digital content and online information, as relevant to their role
	K1.7 Demonstrate appreciation of how to conduct basic searches online, safely and appropriately to find digital information related to their role
	K1.8 Demonstrate awareness of how to verify information, related to the task in hand and job role, is appropriate and correct
	K1.9 Describe how to learn and work remotely using IT
	K1.10 Demonstrate awareness of the benefits of e-learning and immersive technology for training and professional development and how to use and access this
LO2 Interpret and use basic technology and information	S2.1 Use basic digital information and technology securely in accordance with company procedures
	S2.2 Search, select and use work-related digital information, as requested by a supervisor, to support delivery of work-related tasks
	S2.3 Handle standard digital content in order to communicate information, as required for their role in accordance with requests or procedures
LO3 Comprehend standard digital technology and use effectively and securely	S3.1 Use the basic features of relevant digital technology and equipment, as relevant to their role
	S3.2 Use standard technology to save and send digital information, in accordance with procedures
	S3.3 Access appropriate help and support when problems with digital technology arise
	S3.4 Use a range of available technology for training and professional development

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from discussions with candidates about work-based activities on suitable engineering construction industry sites or realistic workplace environment. Such methods may include discussions about product evidence and questioning. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-01S Position and install instrument and controls in engineering construction**
SQA Accreditation unit code: UT31 04	
SCQF level: 7 **Credit value:** 12	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to position and install instrumentation and control components and systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC01

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret relevant legislative, regulatory and local requirements or procedures and safe working practices including their responsibilities with regard to reporting lines and procedures
	K1.2 Distinguish the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Explain relevant legislative, regulatory and local requirements or procedures and safe working practices including their responsibilities with regard to reporting lines and procedures

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO2 Understand the work area, material and equipment preparation and reinstatement requirements for positioning and installing instrument and control systems	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials, tools and equipment, and the possible consequences of incorrect actions in these areas
	K2.2 Examine the importance of correct installation and the related consequences of incorrect installation
	K2.3 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO3 Understand the tools, terminology, techniques and practices for positioning and installing of instrument and control systems.	K3.1 Explain the principles, uses and conventions of engineering drawings, installation instructions and related specifications
	K3.2 Describe the tools used for positioning and installing instrumentation and control equipment, systems and components
	K3.3 Describe the techniques used for ingress protection, foreign material exclusion and protection against damage and the environment, and the importance of these
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to position and install instrument and control systems.	S5.1 **Arrange that the work environment, equipment and materials are suitable for the work activities to be undertaken**
	S5.2 Deal promptly and effectively with problems and report those that cannot be solved
LO6 Position and install instrument and control systems	S6.1 **Interpret relevant drawings and specifications for the installation to be carried out**
	S6.2 **Assemble, install, position and secure the equipment and components in line with specification and agreed procedure**

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	S6.3 **Ensure all the necessary connections to the equipment are complete**
	S6.4 **Ensure that all relevant instrumentation and control equipment and components are free from damage, as appropriate**
	S6.5 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO7 Carry out the necessary actions after completing the disassembling of instrument and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste substances and materials**

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-02S Disassemble instrument and control systems in engineering construction**
SQA Accreditation unit code: UT16 04	
SCQF level: 7 **Credit value:** 10	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to disassemble instrumentation and control systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC02

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials, tools and equipment, and the possible consequences of incorrect actions in these areas

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
requirements for disassembling instrument and control systems	K2.2 Describe waste disposal procedure
	K2.3 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO3 Understand the tools, terminology, techniques and practices for disassembling instrument and control systems.	K3.1 Explain relevant engineering drawings and related specifications
	K3.2 Examine techniques for disassembly including: a. How to ensure appropriate temporary support systems are put into place b. Instrumentation and control component and equipment removal and disassembling
	K3.3 Explain reporting documentation and control procedures
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to dismantle instrument and control systems	S5.1 **Arrange that the work environment, equipment and materials are suitable for the work activities to be undertaken**
	S5.2 Deal promptly and effectively with problems within their control and report those that have been and those that cannot be solved
LO6 Disassemble instrument and control systems	S6.1 **Interpret and follow the relevant specification, as required**
	S6.2 **Ensure if appropriate that components are marked for reassembly**
	S6.3 **Demonstrate the disassembling to the agreed level using correct tools and equipment**

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	S6.4 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO7 Carry out the necessary actions after completing the disassembling of instrument and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste substances and materials**
	S7.1 If components are removed then: a. Identify and record any that need replacing b. Dispose of any that are now redundant c. Correctly record, label and store those for reuse

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-03S Carry out preventative and corrective maintenance on instrumentation and control equipment and systems in engineering construction plant**
SQA Accreditation unit code: UT02 04	
SCQF level: 7 **Credit value:** 12	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to carry out preventative and corrective maintenance on instrumentation and control equipment and systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPI&C03

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials, tools and equipment, and the possible consequences of incorrect actions in these areas

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
requirements to carry out planned maintenance procedures on instrument and control systems	K2.2 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use
LO3 Understand the tools, terminology, techniques and practices to carry out planned maintenance procedures on instrument and control systems	K3.1 Describe preventative maintenance, routine inspection, scheduled maintenance and monitoring and their reasons and benefits
	K3.2 Examine maintenance records and documentation procedures
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to carry out planned maintenance on instrument and control systems.	S5.1 Arrange that the work environment, equipment and materials are suitable for the work activities to be undertaken
	S5.2 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO6 Carry out planned maintenance on instrument and control systems	S6.1 **Undertake routine inspections of the instrumentation and control equipment or system to check if it is working as expected**

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	S6.2 **Demonstrate preventative maintenance on the equipment and systems to prevent failure**
	S6.3 **Undertake any necessary maintenance and inspection related testing procedures including interrogation**
	S6.4 **Check the adjusted instrumentation and controls equipment fails to meet the required operating specification, adjust and retest again, as appropriate**
	S6.5 Complete relevant maintenance records accurately and pass them on to the appropriate person
	S6.6 Report any instances where the equipment fails to meet the required performance after adjustments
LO7 Carry out the necessary actions after completing the planned maintenance	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste substances, components and materials**
	S7.2 Complete maintenance records accurately and pass them to the appropriate person

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites. Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3, S6.4 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-05S Remove and replace instrumentation and control components from equipment and systems in engineering construction**
SQA Accreditation unit code: UT39 04	
SCQF level: 7 **Credit value:** 12	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to remove and replace instrumentation and control components on systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC0505

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment	K2.1 Analyse the preparation and reinstatement requirements in respect of the work area, materials, tools, and equipment

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
preparation and reinstatement requirements to remove and replacement of components from instrument and control systems	K2.2 Explain the preparation and reinstatement requirements in respect of the possible consequences of incorrect actions in these areas
	K2.3 Describe the tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO3 Understand the tools, terminology, techniques and practices for removal and replacement of components from instrument and control systems	K3.1 Explain the principles and uses of engineering drawings, graphical data and related specifications
	K3.2 Examine instrumentation and control component removal methods and techniques including marking, labelling and tagging
	K3.3 Explain how to analyse and check for instrumentation and control component defects including: a. Wear, fatigue and corrosion b. What defects to check for c. How to check for them d. What to do if found
	K3.4 Describe procedures for labelling and storing instrumentation and control components for reuse
	K3.5 Explain instrumentation and control component replacement methods and techniques
	K3.6 Explain reporting documentation and control procedures
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO5 Prepare work area, materials and equipment to remove and replace components from instrument and control systems	S5.1 **Arrange that the work environment, equipment and materials are suitable for the work activities to be undertaken**
	S5.2 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO6 Remove and replace components from instrument and control systems	S6.1 Establish and where appropriate mark components for re-assembly
	S6.2 Demonstrate removal of the required instrumentation and controls components using the correct tools and techniques
	S6.3 Analyse and check the condition of the removed instrumentation and controls components against specification and identify any defects including wear, fatigue and corrosion
	S6.4 Replace the required components using appropriate tools and techniques taking precautions to prevent any damage to components, tools and equipment
	S6.5 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO7 Carry out the necessary actions after completing the removal and replacement of components from instrument and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste materials, substances and components**
	S7.2 Store re-usable materials, equipment and removed components in accordance with appropriate procedures

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites.

	Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3, S6.4 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-09S Assemble components of instrument and control systems in engineering construction**
SQA Accreditation unit code: US98 04	
SCQF level: 7 **Credit value:** 16	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to assemble instrumentation components and control systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPIC09

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials and equipment, and the possible consequences of incorrect actions in these areas

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
requirements for assembling components of instrument and control systems	K2.2 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use
LO3 Understand the tools, terminology, techniques and practices for assembling components of instrument and control systems	K3.1 Explain relevant instructions, assembly drawings and related specifications
	K3.2 Examine assembly methods and procedures for instrumentation and control equipment and systems: a. The implications of different assembly techniques b. Setting up and alignment c. Sequential tightening and torquing d. Fastenings e. Electrical terminations
	K3.3 Describe how to check the assembly is complete and meets the required specification
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to assemble	S5.1 **Arrange that the work environment, equipment and materials are suitable for the work activities to be undertaken**

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
components of instrument and control systems	S5.2 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO6 Assemble components of instrument and control systems	S6.1 **Interpret relevant instructions, assembly drawings and specifications**
	S6.2 **Demonstrate that the correct instrumentation and control equipment, systems and components are available and meet the specification**
	S6.3 **Use the correct tools and techniques to assemble the instrumentation and control equipment and systems into their correct positions**
	S6.4 **Check the securing arrangements of the instrumentation and control equipment and systems**
	S6.5 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO7 Carry out the necessary actions after completing the assembly of components of instrumentation and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste materials and components**

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3, S6.4 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-10S Repair instrumentation and control equipment and systems in engineering construction plant**
SQA Accreditation unit code: UT42 04	
SCQF level: 7 **Credit value:** 9	

Unit purpose and aim:

This unit has been designed to assess learner competence in being able to repair instrumentation and control equipment and systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC10

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, material and tools, the equipment or system to be repaired and, the possible consequences of incorrect actions in these areas

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
requirements to repair components from instrument and control systems	K2.2 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO3 Understand the tools, terminology, techniques and practices for repairing components from instrument and control systems	K3.1 Explain the relevant instructions, technical drawings or other specifications for the instrumentation and control equipment or system to be repaired
	K3.2 Examine the methods and techniques used to repair instrumentation and control equipment or systems including: a. The reasons for repair a. The process(es) for putting in place backup equipment or systems, if needed, whilst repairs are undertaken

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to repair components from instrument and control systems	S5.1 **Arrange that the work environment is suitable for the work activities to be undertaken**
	S5.2 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO6 Repair components from instrument and control systems	S6.1 **Interpret the relevant instructions, technical drawings or other instructions for the instrumentation and control equipment or system to be repaired**
	S6.2 **Prepare the instrumentation and control equipment or system for repair**
	S6.3 **Demonstrate the repairs as required**
	S6.4 **Produce complete records of the repair work carried out, according to the required procedures**
	S6.5 Investigate and deal promptly and effectively with problems and report those that cannot be solved

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO7 Carry out the necessary actions after completing the repair of components from instrument and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste materials and components**

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3, S6.4 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.

ECITB unit:	**MPSI&C-13S Test instrumentation and control equipment and systems in engineering construction plant**
SQA Accreditation unit code: UT50 04	
SCQF level: 8 **Credit value:** 13	

Unit purpose and aim:

This unit has been designed to assess learner competence in testing the performance and condition of instrumentation and control systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC13

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.1 Interpret the requirements of health and safety legislation
	K1.2 Distinguish the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials, tools and equipment, and the possible consequences of incorrect actions in these areas

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
requirements for testing the performance and condition of instrument and control systems	K2.2 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use
LO3 Understand the tools terminology, techniques and practices for testing the performance and condition of instrument and control systems	K3.1 Explain relevant engineering test specifications and manufacturers' information
	K3.2 Examine testing and monitoring techniques including the techniques for ingress protection, foreign material exclusion and the impact that different environmental conditions can have
	K3.3 Explain test documentation used to report on test results and test analysis and the importance of correctly recording the test results
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to test the performance and condition of instrument and control systems	S5.1 **Arrange that the work environment is suitable for the work activities to be undertaken**
	S5.2 Investigate and deal promptly and effectively with problems, reporting solutions, and those that cannot be solved

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO6 Test the performance and condition of instrument and control systems	S6.1 **Ensure that the work environment, materials, tools and equipment are suitably prepared for the work activities to be undertaken**
	S6.2 **Demonstrate critical analysis, testing or monitoring, taking care to prevent any ingress and to exclude foreign material**
	S6.3 **Ensure all necessary testing data has been captured**
	S6.4 Analyse, synthesise and review the test data and compare it, as relevant, against the equipment or systems: a. Testing data history b. Relevant specification or manufacturers' information
	S6.5 Recommend any relevant actions that should be taken, in accordance with procedures
LO7 Carry out the necessary actions after completing testing the performance and condition of instrument and control systems	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste materials and components**
	S7.2 Record the results of the assessment in a clear and accurate manner, identifying any faults and variations

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.1, S6.2, S6.3 & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence.

	Further guidance on this ECITB unit can be found in the SQA E Accreditation CITB Assessment Strategy document.

ECITB unit:		**MPSI&C-16S Diagnose faults in instrumentation and control equipment and systems in engineering construction**
SQA Accreditation unit code: UT13 04		
SCQF level: 8	**Credit value:** 13	

Unit purpose and aim:

This unit has been designed to assess learner competence in diagnosing faults in instrumentation, control equipment and systems.

In the context of this unit, responsibility extends to the interpretation of given specifications, selecting appropriate methods, techniques, choosing and/or modifying procedures to achieve the best possible result in the conditions applying. In some cases, the learner may still be expected to refer to others for final authorisation.

Details of the relationship between the unit and relevant National Occupational Standards or other professional standards or curricula (if appropriate)

Derived from NOS: ECIMPSIC13

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	K1.1 Interpret the requirements of health and safety legislation

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
LO1 Understand health and safety legislation, regulations and safe working practices and procedures	K1.2 Distinguish the purpose and nature of risk assessments, method statements, and permit to work systems, and the relevance of local procedures and guidance notes
	K1.3 Describe reporting lines and procedures
LO2 Understand the work area, material and equipment preparation and reinstatement requirements for testing the performance and condition of instrument and control systems	K2.1 Analyse preparation and reinstatement requirements in respect of the work area, materials, tools and equipment, and the possible consequences of incorrect actions in these areas.
	K2.2 Describe tool and equipment control, the correct use of relevant tools and equipment and their individual responsibility for the use, care and security of those they use.
LO3 Understand the tools, terminology, techniques and practices for determining and diagnosing faults in instrument and control systems	K3.1 Explain the principles and uses of fault diagnostic aids
	K3.2 Examine fault finding methods and techniques
	K3.3 Describe how to how to interpret the information and fault found and the: a. Likely root cause(s) b. The potential consequences associated with it c. Potential corrective or preventative action
	K3.4 Describe how to source and use relevant information on the symptoms and problems associated with the electrical components, equipment and systems
	K3.5 Explain procedures for recording the fault and related diagnosis
LO4 Work safely and minimise risk at all times	S4.1 Identify a range of hazards
	S4.2 Implement appropriate actions to minimise the risk from hazards
	S4.3 Refer safety related matters to appropriate persons as required

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
	S4.4 Organise work in accordance with relevant sections of the Health and Safety at Work Act and its associated regulations
	S4.5 Work in accordance with the requirements of risk assessments and permit to work systems
LO5 Prepare work area, materials and equipment to test the performance and condition of instrument and control systems	S5.1 Arrange that the work environment is suitable for the work activities to be undertaken
	S5.2 Investigate and deal promptly and effectively with problems and report those that cannot be solved
LO6 Diagnose and determine the cause of faults in instrumentation and control equipment and systems	S6.1 Review and use all relevant information on the symptoms and problems associated with the instrumentation and control equipment and systems
	S6.2 **Select, use and apply diagnostic techniques, tools and aids to locate faults**
	S6.3 **Demonstrate the fault diagnosis as required**
	S6.4 Determine the implications of the fault in relation to: a. Related equipment b. Related process c. Health and safety d. The escalation processes
	S6.5 Use the evidence from the diagnosis along with consideration of the implications of the fault in order to draw valid conclusions about the nature and probable cause of the fault
	S6.6 Record details on the extent and location of the faults in an appropriate format
LO7 Carry out the necessary actions after completing diagnosing and	S7.1 **Reinstate the work area to a safe condition and correctly dispose of waste materials and components**

Learning outcomes The candidate will:	**Assessment criteria** The candidate can:
determining faults in instrument and control systems	S7.2 Record the results of the assessment in a clear and accurate manner, identifying any faults and variations

Assessment requirements or guidance specified by a sector regulatory body (if appropriate)	Assessment of this unit will be by occupationally competent assessors approved by an awarding body. They will gather sufficient evidence of competence from work-based activities on suitable engineering construction industry sites or realistic workplace environment. Assessment criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. **Mandatory workplace observation is required for Assessment Criteria S5.1, S6.2, S6.3, & S7.1** which may take the form of an expert witness testimony supported by photographic and/or video evidence. Further guidance on this ECITB unit can be found in the SQA Accreditation ECITB Assessment Strategy document.