QUALIFICATION SPECIFICATION

ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF)

Ofqual QN: 603/3036/3
QW Approval No.: C00/1230/5

Contains the following pathways:

- **Electrical**
- **Instrumentation and control**
- **Mechanical**

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Revisions to this document

The table below sets out all revisions made to this document since it was first issued, and the dates on which the revisions were effective from.

Version	Revision	Page	Effective Date
	Knowledge assessment criteria K7.2 Amended to – K7.2 The importance of correct installation and the related consequences of incorrect installation.		13.02.18
RV2-2	Section 1.4 'Language of Assessment' added	5	01.11.26

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ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF)

1. Introduction

1.1 Objective and overview

The objective of this vocational competence qualification is to provide recognition that a candidate has demonstrated the required level of technical competence to be qualified to work as a maintenance technician on engineering construction plant and systems in **one** of the following disciplines:

- Electrical.
- Instrumentation and Control.
- Mechanical.

The candidate is required to select **ONE** discipline pathway **ONLY** when registering on the qualification**.** Successful completion of the qualification pathway will lead to the candidate being awarded an:

- ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF) – Electrical.
  - **OR**
- ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF) - Instrumentation and Control.
  - **OR**
- ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF) – Mechanical.

The qualification is based on National Occupational Standards (NOS) and has been designed following consultation with industry employers and stakeholders on a qualifications strategy which allows for a wider use of off the job assessment and to further sector needs to improve transferability of skills across the different sectors that comprise the industry. The detail and scope of the assessment criteria within this qualification has been developed by the Engineering Construction Industry Training Board (ECITB) Standards Setting Organisation in conjunction with employers, trainers, and assessors through workshops and consultations.

1.2 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 (coal, gas, nuclear, wind and other renewables) 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 are able to 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. They are able to 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, possibly others' and ensure work is completed safely and effectively, following procedures and completing essential documentation at all times. They work on

various types of plant and systems dependent on their company sector and typically specialise in one of the following: electrical, instrumentation and control or mechanical.

1.3 Entry requirements

There are no mandatory entry requirements. However, due to the level and complexity of the subject, it is recommended that candidates should have attained GCSE grade "C/5" or above or RQF Functional Skills Level 2 or above in English (Language) and Mathematics or are able to demonstrate evidence of other suitable attainment or experience. A candidate's individual circumstances will determine if this qualification is appropriate and the Approved Centre will work with the prospective candidate and, where appropriate, employer to determine suitability for the qualification.

1.4 Language of Assessment

This qualification is available and assessed in English only.

Centres must ensure, prior to registration, that candidates have a sufficient standard of English language competence to understand the qualification requirements, access learning and assessment materials, communicate effectively, and generate evidence that meets the required assessment standards. This applies particularly to candidates for whom English is not their first language.

A candidate's English language ability must be sufficient to enable them to demonstrate the required knowledge, skills, and behaviours independently, without the need for translation or language support that could compromise the validity or reliability of the assessment. Candidates must also be able to communicate effectively in workplace and assessment environments and carry out activities safely and appropriately in accordance with qualification requirements.

1.5 Achievement

This qualification consists of 9 mandatory units. A candidate must successfully meet the selected discipline pathway requirements of all 9 units in order to attain this qualification. This specification details the learning outcomes and assessment criteria that a candidate must meet in order to demonstrate the acquisition of the knowledge, skills and behaviours (KSBs) to be awarded a vocational ECITB Level 3 Diploma in Engineering Construction Maintenance (RQF) in Electrical or Instrumentation and Control or Mechanical. Mandatory observation of the candidate by an Awarding Organisation (AO) assessor is required to achieve this qualification.

Typical types of engineering construction plant and systems for the assessment of each pathway in this qualification are listed in the ECITB AO's '*Approved Centre Qualification Requirements'* document associated with this qualification.

The contents of each unit interrelate, therefore, the AO does not issue credit certificates for completion of standalone units.

1.6 Assessment

Assessment is through a combination of ECITB AO online knowledge tests; observed skills assessment in the 'live' workplace' or under approved simulated workplace conditions; portfolio of evidence; and a final recorded technical discussion.

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1.7 Total Qualification Time (TQT), level and duration

The TQT for this qualification is 1,886 hours. The TQT is broken down by unit in the table below. The amount of time taken to achieve this Level 3 Diploma is typically 36 months.

Unit	Guided Learning (hours)	Total Qualification Time (hours)
Mandatory Units		
MPS01	155	308
MPS02	200	353
MPS03	60	161
MPS04	75	134
MPS05	75	134
MPS06	120	231
MPS07	113	237
MPS08	105	189
MPS09	49	83
Total	**952**	**1,886**

There are no optional units contained in this qualification.

1.8 Equal opportunities, reasonable adjustments and special considerations

For information about fair assessment, equal opportunities, reasonable adjustments and special considerations please refer to the ECITB AO Policies and Procedures published on the ECITB website.

1.9 Career development within the Engineering Construction Industry

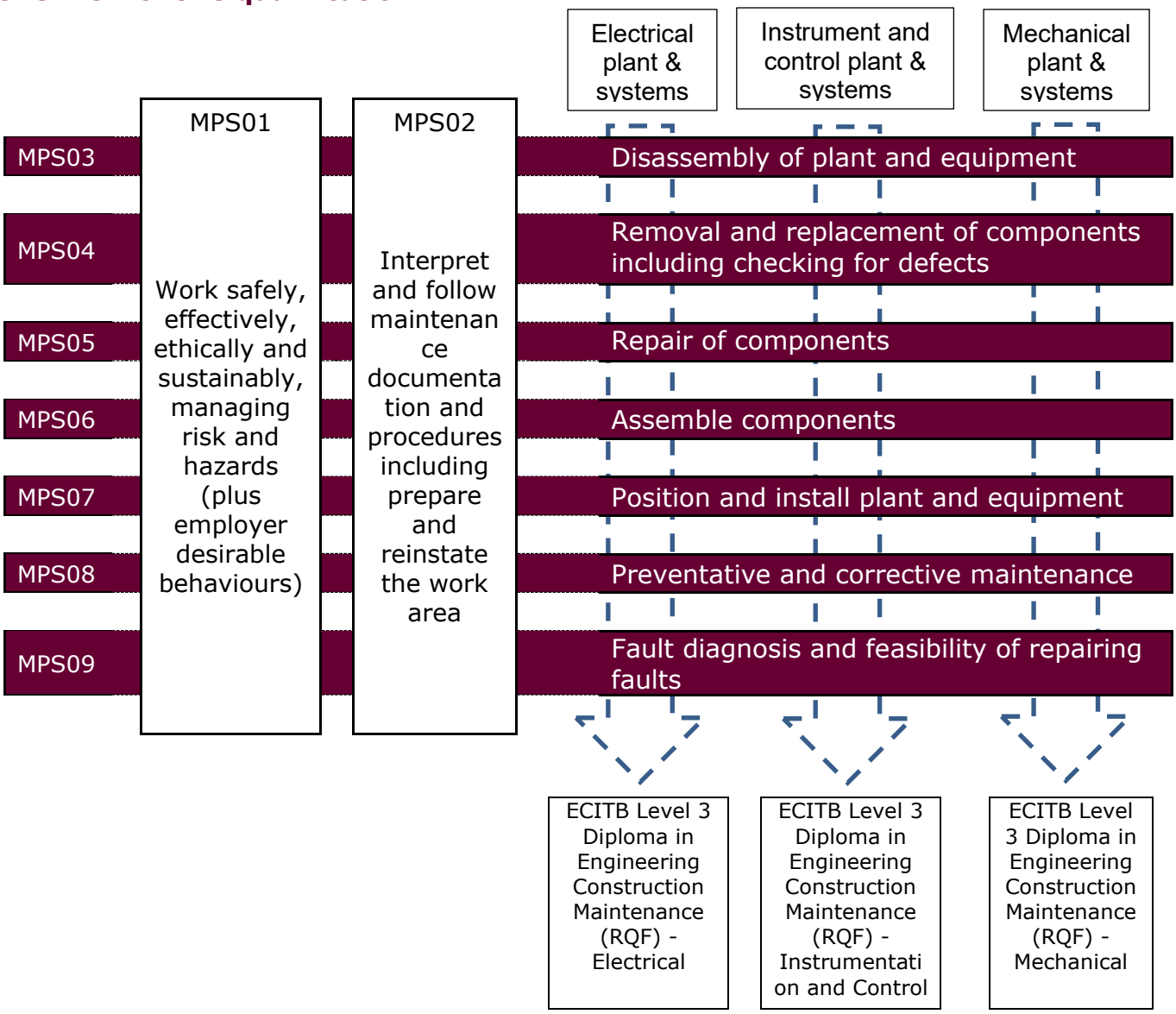
Completing this qualification can lead to a range of further career options. Those who wish to stay in engineering construction can develop their skills further, or progress through supervision to senior positions such as Construction Manager. Individuals can progress through additional qualifications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

For more information about career progression you can go to the ECITB website www.ecitb.org.uk

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2. Qualification units and scope of assessment

Overview of this qualification



This maintenance qualification consists of 9 mandatory units.

The underpinning knowledge, skills and behaviours (KSBs) within units MPS01 and MPS02 are demonstrated by candidates when they undertake the observed practical assessments on plant and systems of their selected discipline to demonstrate the application of the maintenance KSBs detailed in units MPS03 to MPS09.

This vocational qualification has the following elements:

2.1 Underpinning knowledge, skills and behaviours

Units MPS01 and MPS02 detail the factual, procedural and theoretical knowledge that the candidate must acquire and also demonstrate the application of on plant 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.

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- 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 and 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 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.

2.2 Employer-desirable behaviours and attitudes

The candidate must demonstrate the application of the following employer desirable behaviours during the observed skills assessments:

- Safety conscious - works safely at all times.
- Risk aware – manages hazards and minimises risk.
- Effective communicator - works effectively with others including keeping others informed.
- Quality focus – ensures work is completed to an appropriate level of quality.
- Conscientious – follows procedures and completes reporting documentation accurately and correctly.
- Initiative – deals with problems effectively and highlights those that cannot be solved.
- Critical thinker – displays the ability to use vocational knowledge to deal with issues that arise during practical tasks.
- Ethical and environmental sustainability behaviours such as:
    - Manages risk to minimise adverse impact to people, plant or the environment.
    - Uses resources efficiently and effectively.
    - Treats all people fairly and with respect.

2.3 Plant and systems specific maintenance knowledge and skills

Units MPS02 to MPS09 are discipline specific and the candidate must demonstrate their knowledge and application of KSBs on plant and equipment of their selected discipline pathway:

- Electrical plant and equipment.
- Instrumentation and Control plant and equipment.
- Maintenance plant and equipment.

The candidate is required to effectively demonstrate theoretical, factual and procedural knowledge and practical skills of the following units that comprise the qualification. The Approved Centre will discuss with the candidate the detailed assessment scope requirements associated with each unit:

MPS01	Work safely, effectively, ethically and sustainably, managing risks and hazards.
MPS02	Interpret and follow maintenance documentation and procedures including prepare and reinstate the work area.
MPS03	Disassembly of plant and equipment.
MPS04	Removal and replacement of components including checking for defects.

MPS05 Repair of components.
MPS06 Assemble components.
MPS07 Position and install plant and equipment.
MPS08 Preventative and corrective maintenance.
MPS09 Fault diagnosis and feasibility of repairing faults.

2.4 Further information

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

ECITB AO
Office F15, Kings House Business Centre, Home Park Estate,
Station Road, Kings Langley, WD4 8LZ
Tel: 01923 260000
Email: Qualifications@ecitb.org.uk
Website: www.ecitb.org.uk

2.5 Units

Unit MPS01 Work safely, effectively, ethically and sustainably, managing risk and hazards

Learning outcomes for this unit:

1. The candidate can explain health and safety legislation, regulations, safe working practices, personal site safety responsibilities and demonstrate what 'work safely' at all times means as a maintenance technician.
2. The candidate can explain risk and hazard management and demonstrate the ability to identify and take action to deal with potential hazards.
3. The candidate can establish and maintain productive working relationships.
4. The candidate understands lines of communication, responsibilities and can explain quality management systems and can demonstrate effective communication in the context of working as a Maintenance technician.
5. The candidate understands codes of conduct and the importance of ethical working and the need to undertake activities in a way that contributes to environmental sustainability.
6. The candidate is able to work effectively as a maintenance technician by demonstrating all employer desirable behaviours.

Knowledge assessment criteria:
the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:

HEALTH AND SAFETY LEGISLATION AND REGULATIONS

K1.1 The statutory requirements of the main health and safety legislation relevant to the role of maintenance technician.
K1.2 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 The consequences for employers and employees of not fulfilling their legal health and safety responsibilities.
K1.4 The importance of personal behaviour in maintaining workplace standards.

PERSONAL SITE SAFETY RESPONSIBILITIES

K1.5 The need for health and safety training for themselves and others in a workplace, the procedures for requesting training and who to ask for help in understanding the work.
K1.6 Where to get information relating to the safe use of equipment and how to ensure equipment is used safely.
K1.7 When personal protective equipment should be used and how to select and use the correct equipment for the work to be undertaken.
K1.8 The potential for different types of injury including vibration injuries and how they can be prevented.
K1.9 The checks which are needed to make sure that portable electrical appliances are safe to use
K1.10 What a safe system for plant process isolation should include including electrical isolation and why low voltage is generally safer in relation to health and safety.
K1.11 The risks from overhead cables and how to control them.

FIRST AID

K1.12 First aid procedures as used in a typical company and where information about them can be obtained.

K1.13 Which first aid procedures typically apply in a workplace including:

a) The sources of competent assistance
b) How to find local first aid facilities
c) How to alert or summon professional authorities.

EMERGENCY AND EVACUATION PROCEDURES

K1.14 Emergency procedures and evacuation procedures as used in a typical company and where information about them can be obtained from including the different alarm systems.

K1.15 Contingency reporting documentation and systems including: emergencies, accidents and potential incidents.

K1.16 How to call for expert help in the event of contingencies occurring, following relevant procedures

K1.17 How to follow shutdown and evacuation procedures promptly and correctly.

HAZARDS AND HAZARD SPOTTING

K1.18 What a hazard is and common types of hazard associated with processes, tools, equipment and materials.

K1.19 Where information on hazard spotting and safety assessment techniques can be found.

K1.20 Hazard spotting and safety assessment techniques, which apply in a typical work location.

K1.21 The effects of hazards on persons, property and the environment.

K1.22 Who to call for appropriate help using warning systems as appropriate in relation to hazards.

K1.23 What must be done when transporting hazardous substances around a site.

MANAGING HAZARDS AND THE ASSOCIATED RISK

K1.24 What the individual's responsibilities are in terms of dealing with and notifying others of hazards including what should be reported, how to report and, the related documentation.

K1.25 The types of actions that are required to deal with and minimise the risks from different hazards.

K1.26 What risk is in relation to health and safety, its importance and the consequences of poor risk management.

MAINTAINING WORKING RELATIONSHIPS

K1.27 Why it is important to create and maintain working relationships.

K1.28 The different problems that can affect working relationships and the actions that can be taken to deal with specific difficulties.

REPORTING LINES, COMMUNICATION AND QUALITY MANAGEMENT

K1.29 The responsibilities of a maintenance technician in a typical workplace and the responsibilities of others within a typical work location.

K1.30 The importance of reporting lines, procedures, systems and documentation and the consequences of failing to follow them.

K1.31 The limits of own responsibility and who to refer to for clarification on issues.

K1.32 Quality management procedures and the importance of following them.

K1.33 The importance of dealing promptly and effectively with problems and reporting those which cannot be solved.

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ETHICS AND ENVIRONMENTAL SUSTAINABILITY

K1.34 The purpose of ethics and environmental sustainability in a typical workplace.
K1.35 Codes of conduct, including professional codes of conduct relevant to a maintenance technician.
K1.36 The importance of using resources efficiently and effectively.
K1.37 What working ethically means in terms of treating all people fairly and with respect and displaying honesty, integrity, accuracy and rigour.
K1.38 How the role of a maintenance technician impacts on the environment and how this impact can be reduced.

Skills assessment criteria:

the candidate must demonstrate the following on plant and equipment of their selected discipline during the observed skills assessment of units MPS02 to MPS09, specifically the ability to:

SKILLS FOR WORKING SAFELY

S1.1 Work safely at all times complying with statutory health and safety and other relevant guidelines and procedures.
S1.2 Select the correct personal protective equipment for the work to be undertaken.
S1.3 Deal safely with dangers that can be contained using appropriate equipment and materials, in accordance with procedures.

SKILLS FOR MANAGING HAZARDS AND MINIMISING RISK

S1.4 Identify potential hazards in the workplace including hazardous processes, tools, equipment and materials.
S1.5 Safely check for potential hazards in accordance with agreed and approved procedures.
S1.6 Take appropriate action upon identification of a hazard or emergency to minimise the risk from it
S1.7 Report in accordance with procedures / risk control strategy.

SKILLS FOR WORKING RELATIONSHIPS

S1.8 Develop working relationships with a range of people.
S1.9 Deal with disagreements in a professional and constructive manner so that effective relationships are maintained.

SKILLS FOR REPORTING LINES, COMMUNICATION AND QUALITY PROCEDURES

S1.10 Keep others informed about work plans and activities which affect them – either formal/informal, written or verbal.
S1.11 If needed, seek assistance in relation to work related activities from others in a polite and courteous way without causing undue disruption to normal working activities.
S1.12 Respond in a timely and positive way when others ask for help or information e.g. prioritise requests, clarify exactly what is required.
S1.13 Follow quality requirements.
S1.14 Deal with problems appropriately if and when they arise.

SKILLS FOR ETHICS AND ENVIRONMENTAL SUSTAINABILITY

S1.15 Treat everyone fairly and with respect.
S1.16 Demonstrate accuracy and rigour when undertaking practical procedures.
S1.17 Deal effectively with resources taking environmental considerations into account.

Behaviours assessment criteria:

the candidate must demonstrate the following as part of the observed skills assessment of units MPS02 to MPS09 or provide additional evidence as part of their Qualification portfolio of evidence, specifically:

EMPLOYER DESIRABLE BEHAVIOURS

B1.1 Safety conscious - work safely at all times.
B1.2 Risk aware - manage hazards and minimises risk.
B1.3 Effective communicator - work effectively with others including keeping others informed.
B1.4 Quality focus - ensure work is completed to an appropriate level of quality.
B1.5 Conscientious - follow procedures and complete documentation accurately and correctly.
B1.6 Initiative - deal with problems effectively and highlight those that cannot be solved.
B1.7 Ethical and environmental sustainability behaviours such as:
a) Manage risk to minimise adverse impact to people or the environment.
b) Use resources efficiently and effectively.
c) Treat all people fairly and with respect.
B1.8 Critical thinker – display the ability to use vocational knowledge to deal with issues that arise during practical tasks.

Unit MPS02 Interpret and follow maintenance documentation and procedures including prepare and reinstate the work area

Learning outcomes:

1. The candidate must demonstrate that they can interpret and follow maintenance specifications, plans and schedules so that they are able to carry out the job of a maintenance technician effectively.

2. The candidate must demonstrate that they can follow reporting procedures and documentation completion requirements as required to carry out the job of a maintenance technician effectively.

3. The candidate can explain and demonstrate how to prepare and reinstate the work area, material and equipment safely and correctly before and after maintenance procedures take place.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:

MAINTENANCE DOCUMENTATION

K2.1 The principles, uses and conventions of:
- a) Method statements.
- b) Product worksheets.
- c) Technical drawings.
- d) Related specifications.

K2.2 The information detailed in the diagrams in engineering drawings and related specifications and how it relates to the physical component(s).

K2.3 The diagrams and key information found in:
- a) Parts' catalogues.
- b) Maintenance manuals.

K2.4 Where to find maintenance manuals or additional information that may be necessary in order to undertake maintenance.

K2.5 Maintenance plans and schedules and their use.

MAINTENANCE PROCEDURES

K2.6 Typical maintenance authorisation procedures.

K2.7 Maintenance procedures related to undertaking maintenance activities.

K2.8 Procedures related to reporting on maintenance activities and the related reporting documentation in

Skills assessment criteria: the candidate must demonstrate the ability to:

MAINTENANCE DOCUMENTATION

S2.1 Check the validity or the documentation being used.

S2.2 Interpret and follow specifications, engineering drawings and work instructions including:
- a) Method statements.
- b) Product worksheets.
- c) Technical drawings.
- d) Related specifications.

S2.3 Interpret and follow equipment manuals.

S2.4 Interpret maintenance plans and schedules.

MAINTENANCE PROCEDURES

S2.5 Follow authorisation procedures.

S2.6 Follow all relevant procedures as appropriate (including any related to foreign material exclusion).

S2.7 Follow procedures and report on the completion of activities for each maintenance stage in accordance with procedures.

S2.8 Complete all relevant documentation correctly and accurately at all stages.

S2.9 Report any instance where the maintenance activities cannot be fully met or where there are identified defects or variations from the specification or outside the planned schedule.

S2.10 Check required maintenance reporting is completed correctly once the

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other words - who to report to, what to report and when to report. K2.9 The importance of checking and confirming procedures have been followed and documentation correctly completed. **HANDOVER MAINTENANCE ACTIVITIES** K2.10 Typical handover procedures and environments including: a) When handover should occur. b) Related quality control systems and documentation procedures. c) How to confirm the precise moment of transfer. d) Why it is important to define the precise moment of transfer. e) The level of detail and information required by different parties for handover. f) How to confirm the information at handover is accurate and complete. **PREPARE AND REINSTATE THE WORK AREA** K2.11 The consequences/hazards of incorrectly preparing or reinstating the work areas, material and equipment. K2.12 The procedures for the connection and operation of applicable services and equipment including but not limited to pneumatic, electric, gas and hydraulic. K2.13 The types of equipment used and explain the care and control procedures. K2.14 How to check materials for correct specification, quantity and quality. K2.15 Material handling techniques and preparation methods. K2.16 Storage methods and procedures. K2.17 Typical waste minimisation and disposal procedures.	maintenance activity is completed and before any handover takes place. **HANDOVER MAINTENANCE ACTIVITIES** S2.11 Follow appropriate handover procedures, confirming and recording acceptance of responsibility in line with procedures including: a) Clearly define and obtain agreement on the moment of transfer of responsibility. b) Communicate handover of control as specified. c) Make sure information received at the handover is accurate, up-to-date and complete. d) Seek additional information if there are areas of doubt or lack of clarity. e) Provide proper support and co-ordination to those transferring control. **PREPARE AND REINSTATE THE WORK AREA** S2.12 Follow safety procedures, risk assessment and methods of work when preparing and reinstating the work area, materials, tools and equipment. S2.13 Obtain, check against relevant specification and prepare the appropriate tools, materials and equipment and check a) Quantities. b) That they are in a safe and usable condition. S2.14 Ensure that all necessary service supplies are connected correctly and ready for use. S2.15 Ensure that any stored energy or substances are released correctly and safely, where appropriate. S2.16 Ensure all isolations and disconnections to the equipment are completed in line with the approved procedures (stored energy, substances, air, fluids, gas, mechanical, electrical).

	S2.17 Provide and maintain safe access to the work area. S2.18 Ensure that arrangements are made to protect other workers from activities likely to disrupt normal working. S2.19 Deal promptly and effectively with problems and report those that cannot be solved. **SKILLS FOR REINSTATEMENT ONLY** Reinstate the work area to a safe condition taking safety and environmental considerations into account by: S2.20 Correctly disposing of waste materials. S2.21 Storing re-usable materials and equipment in accordance with procedures. S2.22 Ensuring any necessary connections to equipment are established and complete. S2.23 Minimising waste wherever possible.

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Unit MPS03 Disassemble plant and equipment

Learning outcome: The candidate understands disassembly techniques and can disassemble plant and equipment safely and effectively to requirements and procedures.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:	**Skills assessment criteria**: the candidate must demonstrate the ability to:
K3.1 Disassembly techniques. K3.2 How to ensure that stored energy or substances or other hazardous material are released safely in accordance with health, safety and environmental (HSE) requirements. K3.3 The tools used to carry out disassembly.	S3.1 Establish and where appropriate mark components for re-assembly. S3.2 Make isolations and disconnections in line with procedures and ensure any stored energy or substances are released safely and correctly in accordance with HSE requirements. S3.3 Carry out disassembly to the specified level using the correct tools and techniques.

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Unit MPS04 Remove and replace components

Learning outcome: The candidate understands how to remove and replace components of plant and equipment and can do this safely and effectively to requirements and procedures.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:	**Skills assessment criteria**: the candidate must demonstrate the ability to:
REMOVE COMPONENTS K4.1 The main component removal methods and procedures which could include proof marking, labelling and tagging. K4.2 How to check for common component defects i.e. wear, fatigue and corrosion. K4.3 What action should typically be taken in relation to component defects. K4.4 Procedures for labelling and storing components for reuse.	**REMOVE COMPONENTS** S4.1 Mark component orientation for reassembly, if appropriate. S4.2 Note configuration for reinstatement. S4.3 Remove the required component using appropriate tools and techniques. S4.4 Take precautions to prevent damage to components, tools and equipment. S4.5 Check the condition of the removed components and identify any defects i.e. wear, fatigue and corrosion. S4.6 Record components that need replacing. S4.7 Label and store or discard the removed components in accordance with approved procedures.
REPLACE COMPONENTS K4.5 Component replacement techniques. K4.6 Techniques used when handling equipment.	**REPLACE COMPONENTS** S4.8 Obtain the required components. S4.9 Ensure replacement components to be used meet the required specification. S4.10 Replace the components using appropriate tools and techniques in the correct sequence taking precautions to prevent any damage to components, tools and equipment. S4.11 Make any necessary settings and adjustments to components to ensure they function correctly.

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Unit MPS05 Repair components

Learning outcome: The candidate understands how to repair components of plant and equipment and can do this safely and effectively to requirements.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:	**Skills assessment criteria**: the candidate must demonstrate the ability to:
K5.1 How to check for common component defects i.e. wear, fatigue, erosion, tear and corrosion. K5.2 What action should typically be taken in relation to component defects. K5.3 Component repair techniques and procedures. K5.4 Where to locate specific information needed in order to carry out repairs correctly. K5.5 What action should typically be taken if it is not possible to repair the components.	S5.1 Prepare the components for repair. S5.2 Carry out repairs to specification. S5.3 Ensure that the repaired component meets the specified operating conditions.

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Unit MPS06 Assemble components

Learning outcome: The candidate understands the techniques used when assembling components of plant and equipment and can assemble components safely and effectively to requirements.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:	**Skills assessment criteria**: the candidate must demonstrate the ability to:
K6.1 Component assembly techniques and procedures. K6.2 The tools used for assembling plant and equipment. K6.3 The types of defects that may be found when assembling plant and equipment and the related quality. control procedures to be followed K6.4 What to do if one of the components is discovered to be unserviceable.	S6.1 Ensure the correct components are available and in a usable condition. S6.2 Assemble the components in accordance with the specification. S6.3 Secure the components using the specified connectors and securing devices. S6.4 Check the completed assembly, that all assembly instructions have been followed and that the finished assembly meets the specification.

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Unit MPS07 Position and install plant and equipment

Learning outcome: the candidate understands the techniques used when positioning and installing plant and equipment and are able to install plant and equipment safely and effectively to requirements.

Knowledge assessment criteria: the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:	**Skills assessment criteria**: the candidate must demonstrate the ability to:
K7.1 Installation techniques and procedures including quality control procedures to be followed. K7.2 The importance of correct installation and the related consequences of incorrect installation. K7.3 The tools used for positioning and installing plant and equipment. K7.4 The techniques for foreign material exclusion and the importance of this. K7.5 The types of defects that may be found when assembling plant and equipment.	S7.1 Install, position and secure the equipment and components in their correct positions in accordance with the specification and/or instructions. S7.2 Undertake foreign material exclusion procedures, as appropriate. S7.3 Ensure all necessary connections to the equipment are complete. S7.4 Ensure the installation is protected from the environment and potential damage. S7.5 Check that the installation is complete and to the required specification. S7.6 Check that all relevant components are free from damage.

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Unit MPS08 Plant and equipment performance – preventative and corrective maintenance

Learning outcome: The candidate understands plant and equipment performance and is able to safely and effectively undertake preventative and corrective maintenance to ensure the plant and equipment is functioning as specified, this includes making adjustments and/or recommending actions to be taken, as appropriate.

Knowledge assessment criteria:
the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:

PREVENTATIVE AND CORRECTIVE MAINTENANCE

K8.1 The importance of preventative and corrective maintenance.
K8.2 The principles and uses of manufacturers' and company specifications on performance requirements of plant and equipment.
K8.3 The reasons, benefits and procedures for routine and scheduled maintenance.

ROUTINE INSPECTION

K8.4 The requirement to carry out routine inspections.
K8.5 The routine inspection processes including visual checks.
K8.6 The tools and equipment required to carry out routine inspections.

TESTING AND MONITORING

K8.7 The difference between testing and monitoring.
K8.8 Testing and monitoring techniques including:
- a) Relevant procedures.
- b) The parameters that can be checked and tested.
- c) The environmental impact of testing.
- d) Environmental controls relating to testing.
- e) The main equipment used.

K8.9 How to set-up, check and calibrate the equipment that is used for testing and/or monitoring.

ANALYSE THE TEST RESULTS

K8.10 How to analyse the inspection and

Skills assessment criteria:
the candidate must demonstrate the ability to:

PREVENTATIVE AND CORRECTIVE MAINTENANCE

S8.1 Interpret the required performance criteria for the plant and equipment.
S8.2 Follow procedures for failure and fault identification and recommend relevant action to be taken which could include:
- a) Changes to the routine or maintenance schedule.
- b) Escalation.
- c) Immediate fix.
- d) Reporting.
- e) Taking into consideration planned routine or scheduled maintenance.

ROUTINE INSPECTION

S8.3 Inspect the plant to check if it is working as expected including:
- a) Inspection for damage/wear/corrosion/movement.
- b) The condition of coatings and insulation.
- c) Checking outputs.
- d) Safety limits checks.

S8.4 Record the outcome of the inspection:
- a) Highlight any causes for concern.
- b) Recommend relevant actions to be taken.

TESTING AND MONITORING

S8.5 Follow a written scheme.
S8.6 Check, calibrate and setup the testing and/or monitoring equipment.
S8.7 Carry out the testing and/or monitoring activities effectively, using the correct procedures with the minimum disruption to normal activities
- a) resolve promptly any inconsistencies in the data

test data in order to carry out an assessment including: a) Comparison against the previous maintenance history. b) The main techniques used. K8.11 The documentation used to report on test results and test analysis. K8.12 What actions to take dependent on the outcome of the analysis. **CORRECTIVE MAINTENANCE: ADJUST** K8.13 The different types of adjustment techniques. K8.14 The tools and materials used for adjustment of plant and equipment.	b) record the outcomes of the tests. **ANALYSE THE TEST RESULTS** S8.8 Analyse the data, ensuring all necessary data has been captured. S8.9 Check that the data analysis is accurate and thorough and takes account of the test conditions. S8.10 Review test data and compare against: a) The previous maintenance history. b) Manufacturer's specification. S8.11 Record the results of the assessment in a clear and accurate manner identifying any faults and variations. S8.12 Recommend any relevant actions that could be taken, this could include: a) Adjustment. b) Further tests. c) Report to manufacturer. d) Inhouse repair. e) Specialist contractor. f) No actions required. **CORRECTIVE MAINTENANCE: ADJUST** S8.13 Following testing, adjust the plant and equipment in accordance with the specification. S8.14 Confirm – retest if appropriate - that the adjusted equipment meets the required operating specification. S8.15 Report any instances where the equipment fails to meet the required performance after adjustments or where there are identified defects outside the required adjustments.

Unit MPS09 Fault diagnosis and feasibility of repair

Learning outcome: the candidate understands how to diagnose and determine the root cause(s) of faults in plant and equipment is able to find the faults and determine the feasibility of repairing them.

Knowledge assessment criteria:
the candidate must demonstrate an understanding of the following in order to satisfy the skills assessment criteria:

FAULT DIAGNOSIS

K9.1 The main techniques used for fault finding.
K9.2 The logical process of fault diagnosis.
K9.3 The principles and uses of fault diagnosis.
K9.4 The principles and uses of diagnostic aids.
K9.5 The importance of accurate data recording with regards to the results of diagnosis and the process employed in the workplace.
K9.6 How to analyse information and identify likely risks.
K9.7 Sources of existing data and comparable measurements.

FEASIBILITY OF REPAIR

K9.8 How to determine if it is feasible to repair a fault that has been found.
K9.9 How to assess the condition of a component or asset.
K9.10 How to determine the feasibility and viability of repairs.
K9.11 Component repair methods and (see unit MPS05)
K9.12 The factors that determine the costs and are considered when:
- a) Determining the feasibility and viability of repairs including consideration of
  - Cost.
  - Delivery.
  - Equipment obsolescence/life-cycle.
- b) Reporting on findings and conclusions on the feasibility and cost effectiveness of repairs.

Skills assessment criteria:
the candidate must demonstrate the ability to:

FAULT DIAGNOSIS

S9.1 Review and use all relevant information on the systems and problems associated with the components, plant and equipment.
S9.2 Investigate and establish the most likely root cause of faults.
S9.3 Select, use and apply diagnostic techniques to locate faults.
S9.4 Complete the diagnosis within agreed time and take action to inform the appropriate people when this cannot be achieved.
S9.5 Determine the implications of the fault for other work and safety considerations.
S9.6 Use the evidence gained to draw valid conclusions about the nature and probable cause of the fault.
S9.7 Record details on the extent and location of the faults in an appropriate format.

FEASIBILITY OF REPAIR

S9.8 Demonstrate how to determine the feasibility of repair specifically:
- a) Assess the level of wear or damage to the components and determine what work is required to bring the component back to the specified condition.

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