ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Engineering maintenance technician – dual discipline

Specification

QAN 610/6344/7
ST1443 V1.0

Specification for

EEA Level 3 End-point Assessment for Engineering maintenance technician – dual discipline

QAN 610/6344/7

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Updates to this specification

Since the first publication of the EEA Engineering maintenance technician (EMT) – dual discipline Specification, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v1.0	September 2025	First published	All

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Section 1: At a Glance EPA Summary

Qualification name	EEA Level 3 End-point Assessment for Engineering maintenance technician – dual discipline
Ofqual qualification number	610/6344/7
Standard reference	ST1443
Assessment plan	V1.0
Standard title	Engineering maintenance technician – dual discipline
Specialist options	• Electrical and control instrumentation engineering maintenance technician • Electrical and mechanical engineering maintenance technician
Level	3
On-programme duration	Typically 48 months Must spend a minimum of 4 months on the program and complete the required off-the-job training according to the apprenticeship funding rules
Gateway readiness	Mandatory requirements: • Employer or training provider must confirm the apprentice is ready to take the EPA • Apprentice must achieve English and mathematics qualifications in line with the apprenticeship funding rules • Compile and submit an EPA portfolio, on which the interview will be based To confirm the apprentice has met all Gateway pre-requisites, employer must complete, sign and

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	submit the Gateway Eligibility Form (GER) form to EEA. See Appendix B, Engineering maintenance technician – dual discipline Supporting Documents 'Gateway Eligibility Form.'
End-point assessment duration	Typically 4 months after the Gateway
End-point assessment methods and their order	The assessment components can be delivered in any order. The result of one assessment method does not need to be known before starting the next: • Observation with questions • Interview (based on an EPA portfolio) • Multiple-choice test
End-point assessment methods and component grading	• Observation with questions: Fail; Pass; or Distinction • Interview (based on an EPA portfolio): Fail; Pass; or Distinction • Multiple-choice test: Fail or Pass
Overall Grading	Fail; Pass; Merit or Distinction
Certification	EEA request Apprenticeship completion certificates from the Apprenticeship Assessment Service
Glossary of Terms	Appendix A, Engineering maintenance technician – dual discipline Supporting Documents

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Objective

The purpose of the Engineering maintenance technician (EMT) – dual discipline end-point assessment (EPA) is to confirm that an apprentice is fully capable of doing their job before they receive their apprenticeship certificate. It also helps to demonstrate that what an apprentice has learned can be applied in the real world.

Once the apprentice has completed the EMT- dual discipline end-point assessment requirements successfully and has been certified they could take on the following job role:

- Control, instrumentation and automation technician
- Electrical and instrumentation craftsperson
- Electrical and instrumentation technician
- Electrical and mechanical maintenance craftsperson
- Engineering and mechanical maintenance technician
- Engineering maintenance technician
- Engineering technician
- Maintenance and operations engineering technician
- Maintenance engineering technician
- Maintenance technician

Professional recognition

The apprenticeship standard aligns with:

- Institution of Mechanical Engineers (IMechE) for Engineering Technician (EngTech)
- The Institution of Engineering and Technology (IET) for Engineering Technician (EngTech)

Gateway readiness

Gateway takes place before the EPA can start. The employer and training provider will review their apprentice's knowledge, skills and behaviours to see if they have met the minimum requirements of the apprenticeship set out in the apprenticeship standard and are ready to take the assessment. Only apprentices who complete Gateway successfully can start the EPA. Gateway pre-requisites are listed in the summary table above. The Gateway Eligibility Form must be completed see EMT – dual discipline Supporting Documents Appendix B.

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Recognition of prior learning (RPL)

Energy and Environment Awards does not recognise any apprentice prior learning (RPL) or prior achievement (RPA) for the purpose of amending the assessment requirements of any end-point assessments.

Please refer to the Energy and Environment Awards RPL and RPA policy at: https://energyenvironmentawards.co.uk/wp-content/uploads/2025/08/RPL-and-RPA-Policy-V2.pdf

In order for Energy and Environment Awards (EEA) to award an end-point assessment qualification, the apprentice must successfully complete all required assessment components with EEA. This means that:

- each of the EPA components must be completed in full with EEA
- where an apprentice transfers to EEA from another EPAO they have to undertake the entire EPA with EEA
- components of the EPA cannot be certificated in isolation
- evidence for the portfolio and interview must be produced while the apprentice is on-programme to demonstrate current practice

This does not affect the Gateway requirements which must be met in order for an apprentice to be eligible for end-point assessment.

This does not affect any reasonable adjustments that may be granted.

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Section 2: End-point Assessment Components

Component 1: Observation with questions

Overview

In the observation with questions, an independent assessor, approved by Energy & Environment Awards, will observe the apprentice in their workplace as they complete their day-to-day duties under normal working conditions. The apprentice will demonstrate the application of the relevant job role knowledge, skills and behaviours (KSBs) mapped to this assessment method through natural occurring evidence. Observations must take place in a realistic working environment that does not require special clearance. Simulation is not permitted, except in the exceptional circumstances such as national security restrictions, nuclear licenced sites or live gas environments, where access is limited.

The independent assessor will ask questions during or after the observation to clarify or confirm coverage of the mapped KSBs. To minimise disruption, questions will be asked during natural breaks in work or after tasks are completed to ensure there is no disruption to the apprentice's work flow. Energy & Environment Awards will provide the apprentice with at least **two weeks' notice** of the assessment.

The following table outlines the procedure for conducting an observation with questions:

Assessors	1 Independent assessor, approved by EEA.
Practical structure	The total assessment time is 5 hours. The assessor can increase the time by up to 30 minutes (10%) to allow the apprentice to complete a task or respond to a question if necessary. The assessment **may be split into discrete sections** held on the same working day. **The apprentice may choose to end the observation with questions early.** Before doing so, they must be confident that they have demonstrated competence against all relevant assessment requirements. The independent assessor will ensure the apprentice fully understands the assessment requirements and the potential implications of ending the assessment early. Where appropriate, the independent assessor may advise the apprentice to continue with the assessment.

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	The independent assessor must: • **only observe one apprentice at time** to ensure quality and rigour • ask questions to assess the level of competence against the grading descriptors. Questioning will take place during and after work completion The observation with questions may be split into discrete sections held on the same working day. There may be breaks during the observation to allow the apprentice to move from one location to another and for meal/comfort breaks. During these breaks, the clock will be stopped and then restarted to ensure that the assessment duration is not reduced. The breaks **must be invigilated** during the assessment, to maintain security of the EPA, in line with EEA's malpractice policy.
Under what exceptional circumstances can the observation with questions take place in a simulated environment? And What conditions must be met for this to be allowed?	In **exceptional cases** where the apprentice's usual workplace cannot be accessed due to **national security clearance, nuclear site restrictions or live gas safety concerns**, the observation with questions can take place in a simulated. In these situations, the independent assessor must seek guidance from EEA on how to arrange access and record evidence in line with the employer's requirements. The simulated environment will be chosen by EEA and must reflect the apprentice's natural working setting. Suitable locations could include a training provider's site, a training facility within the employer's premises, a test centre or another similar environment. **Only specific skills – S32; S39; S41; S56 and S58 may be assessed in this simulated setting**. These may require minimal pre-installed elements to replicate real scenarios, and this must be agreed with Energy and Environment Awards in advance.
Where will the assessment take place?	The observation with questions must take place at the apprentice's workplace in a real work setting under normal working conditions. **Simulation is not permitted under normal circumstances. Where access to the site is restricted, exceptional arrangements may apply see above.**

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	Questioning that follows the observation must take place in a quiet location, free from distractions and influence.
What are the tasks that will be covered?	The apprentice will be observed carrying out **all** of the following core activities during the observation with questions: **Core** • organising own work • maintaining workplace health, safety, security, and environmental compliance • using work information and following working practices • completing work records • communicating with others The apprentice will also be observed carrying out **ONE** of the following specialist options: **Specialist Option - Electrical and control instrumentation engineering maintenance technician** • conducting planned electrical and control and instrumentation maintenance **Specialist Option – Electrical and mechanical engineering maintenance technician requirements** • conducting planned electrical and mechanical maintenance These activities provide the apprentice with the opportunity to demonstrate the KSBs mapped to this assessment component. **For further details refer to 'Knowledge, Skills and Behaviours (KSBs) Coverage' below pages [12 - 80].**
Who sets the task(s)?	EEA will review the employer and/or training provider planned tasks which are based on the activities listed above. The tasks completed should contribute to workplace productivity. See Appendix D, EMT – dual discipline Supporting Documents 'Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form.'
What resources can the apprentice use?	The employer/training provider will provide equipment and resources needed for the observation with questions. Equipment and resources needed for the observation with questions must be:

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	• the tools, plant, machinery, equipment and PPE required for the job • in good and safe working condition Relevant work instructions/manuals must be available in hard copy or electronically.
How many questions will the apprentice be asked?	The independent assessor: will ask a minimum of 6 questions may ask follow-up questions in order to seek clarification
What will the questions focus on?	Underpinning knowledge and/or skills and behaviours where an opportunity to observe them has not occurred.
Grading	Fail, Pass or Distinction.

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Observation with questions knowledge, skills and behaviours (KSBs) coverage

The observation with questions covers:

Observation with questions Theme and Core KSBs: Organising own work	Amplification and Guidance

K4 Business operation considerations: quality, cost, delivery, and ethical practices.	• Costs
	  ○ Fixed: rent, property insurance, utilities, assets, equipment depreciation, business insurance, business rates
	  ○ Variable: wages, fuel, consumables, tools, sub-contractors and other third parties
	  ○ Warranties and service agreements
	• Service delivery
	  ○ Quality of work and outcomes
	  ○ Timeliness and responsiveness to requirements
	  ○ Customer satisfaction and feedback
	  ○ Compliance with safety and regulatory standards
	• Ethical considerations
	  ○ Fair and transparent pricing
	  ○ Environmental responsibility
	  ○ Welfare and working conditions
	  ○ Legal and regulatory compliance

K5 Planning, prioritisation, organisation, and time management techniques.	• Type of maintenance required (e.g. reactive, preventive, predictive) • Priority setting and adjustment based on operational needs • Maintenance schedules and planning approaches

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Observation with questions Theme and Core KSBs: Organising own work	Amplification and Guidance

	• Scheduling methods (e.g. block scheduling, shift-based, downtime coordination)
	• Work orders and task tracking
	• Resource allocation including:
	  ○ Equipment including personal protective equipment (PPE)
	  ○ Parts and tools
	  ○ Specialist equipment
	  ○ Consumables
	  ○ Headcount and team coordination
	• Handover procedures to ensure continuity and clarity
	• Documentation tools and systems, such as:
	  ○ Gantt charts
	  ○ Spreadsheets
	  ○ Project management software (e.g. Microsoft Project)
	• Lean Maintenance Techniques, including:
	  ○ 5S
	  ○ Kaizen
	  ○ Condition-Based Maintenance (CBM)
	  ○ Total Productive Maintenance (TPM)
	  ○ Root Cause Analysis (RCA)
	• Performance Measurements Tools, such as:
	  ○ Key Performance Indicators (KPIs)
	  ○ SMART targets

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Observation with questions Theme and Core KSBs: Organising own work	Amplification and Guidance
	○ Reliability-Centered Maintenance (RCM)
S2 Use planning, prioritising, organising, and time management techniques to plan tasks.	• Setting priorities based on task urgency and operational needs • Developing and following maintenance schedules • Applying scheduling methods (e.g. block scheduling, shift-based planning, downtime coordination) • Managing work orders and task tracking • Allocating resources effectively, including: ○ Equipment and PPE ○ Parts and tools ○ Specialist equipment ○ Consumables ○ Workforce planning • Conducting effective handovers to ensure continuity • Using documentation and planning systems, such as: ○ Gantt charts ○ Spreadsheets ○ Calendars ○ Project management software (e.g. Microsoft Project) • Apply lean maintenance techniques including: ○ 5S, ○ Kaizen ○ Condition-Based Maintenance (CBM) ○ Total Productive Maintenance (TPM)

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Observation with questions Theme and Core KSBs: Organising own work	Amplification and Guidance
	○ Root Cause Analysis (RCA) • Monitoring performance using: ○ Key Performance Indicators (KPIs) ○ SMART targets ○ Reliability-Centered Maintenance (RCM)
S3 Identify and organise resources to complete tasks. For example, consumables.	• Identifying and organising: ○ Tools ○ Equipment ○ Documentation (hard copies and electronic formats) ○ Consumables ○ Human resources ○ Parts and materials ○ Facilities and workspace • Selecting and preparing: ○ Specialist PPE (e.g. electrical gloves, confined space gear, working at height equipment, hot work protection) ○ Technology and digital tools ○ Calibrated specific checks to meet • Conducting specific checks to meet regulatory equipment, such as: ○ Lifting Operations and Lifting Equipment Regulations (LOLER) ○ Provision and Use of Work Equipment Regulations (PUWER) ○ Portable Appliance Testing (PAT)

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance

K9 Work environment hazards and risks. Risk assessments.	• Types of hazards
	  ○ Physical (e.g. noise, slips, trips and falls)
	  ○ Chemical (e.g. exposure to hazardous substances)
	  ○ Mechanical and electrical (e.g. moving parts, live circuits)
	  ○ Ergonomic (e.g. repetitive strain, poor posture)
	  ○ Psychosocial (e.g. stress, fatigue, lone working)
	• Risk Assessments
	  ○ Types: Generic and dynamic risk assessments
	  ○ Hazard identification: Recognising potential hazards associated with engineering maintenance tasks
	  ○ Risk Evaluation: Assessing the likelihood and severity of risks to determine appropriate control measures; identify new risks and evaluate
	  ○ Control measures: implement measures to mitigate identified risks, ensuring the safety of all personnel and the environment, management of actions
	  ○ Documentation: Accurately recording risk assessments, including identified hazards, risk levels and control measures

K10 Safe systems of work.	• Key elements of a Safe System at Work:
	  ○ Hazard identification
	  ○ Risk assessment
	  ○ Procedure, process development or optimisation

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Implentation of control measures ○ Training, competency and self-development ○ Effective communication ○ Monitoring and supervision ○ Review, continuous improvement and lessons learned ○ Emergency procedures (e.g. evacuation, accident response, electrocution protocols, use of insulator equipment such as plastic brooms) • Types of Safe Systems of Work (SSoW) ○ Standard Operating Procedures (SOPs) ○ Permit to Work Systems ○ Safe Work Method Statements (SWMS) ○ Risk Control Plans
K11 Personal protective equipment (PPE): selection, use, and care.	• Common PPE types: ○ Safety boots/shoes ○ Safety glasses ○ Overalls ○ Face masks ○ Protective gloves (e.g. general use, heat-resilient gauntlets, insulated electrical gloves) ○ Hard hat, bump caps ○ Goggles

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Weld masks ○ Respirator • Role specific PPE and safety equipment: ○ Gas monitors ○ Oxygen supply systems ○ Safety harnesses and fall arrest systems • PPE care and management: ○ Correct selection based on task and environment ○ Proper use and wearing techniques ○ Inspection for damage or wear ○ Cleaning, maintenance and storage ○ Replacement schedules and reporting defects
K12 Asset security requirements.	• Mechanical security: ○ Use of mechanical locks and secure storage ○ Maintenance and inspection of locking mechanisms • Access control: ○ Controlled access to restricted areas ○ Key management and authorisation protocols • Digital and cyber security: ○ Use of cyber systems to protect electronic data ○ Awareness of data protection policies and secure handling of digital information

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance

	• General asset protection:
	  ○ Adherence to procedures for safeguarding tools, equipment and materials
	  ○ Reporting and escalation of security breaches or concerns

K15 Recycling and waste management requirements.	• Company procedures:
	  ○ Waste management and recycling policies
	  ○ Procedures for handling, segregating and disposal of waste appropriately
	  ○ Identification and separation of recyclable, non-recyclable and hazardous waste
	• Safe handling and disposal of hazardous materials:
	  ○ Use of appropriate containers and labelling
	  ○ Storage and transport in line with safety protocols
	  ○ Reporting and escalation procedures for spills or incidents
	• Relevant legislation and regulations:
	  ○ Hazardous Waste (England and Wales) Regulations 2005 which governs classification, tracking and safe disposal of hazardous waste
	  ○ Environmental Protection Act 1990, which sets the legal framework for waste management and pollution control, including the duty of care for waste producers

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Waste Electrical and Electronic Equipment (WEEE) Regulations 2013, which promotes the recovery, reuse and recycling of electrical and electronic equipment to reduce landfill
S7 Identify environmental and health and safety hazards and risks and apply control measures.	• Identifying environmental hazards and risks, such as: ○ Oils, greases, paints, coolants and other chemicals (e.g. those covered by Control of Substances Hazardous to Health (COSHH) ○ Contaminated waste and hazardous disposal materials ○ Volatile Organic Compounds (VOCs) ○ Ground and water pollution ○ Noise pollution and overuse of resources ○ Specialist hazards (e.g. air pollution and radiation) • Identifying health and safety hazards and risks, including: ○ Physical: slips, trips, falls, working at height, manual handling ○ Confined spaces and hot works ○ Chemical: exposure to harmful substances ○ Mechanical: injuries from moving machinery, tools and loose objects, sparks ○ Stored energy: hydraulic, pneumatic, steam, electrical, spring-loaded systems ○ Electrical: electrocution, burns or fires ○ Ergonomic: poor posture, repetitive strain; musculoskeletal disorders ○ Psychosocial: stress, fatigue, disputes, irregular hours, repetitive tasks

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Other hazards: radiation, oxygen depletion, excessive noise levels • Applying control measures using the hierarchy of control: ○ Elimination of the hazard ○ Substitution with a safer alternative ○ Engineering controls (e.g. guarding, isolation) ○ Administrative controls (e.g. procedures, training, supervision) ○ Use of PPE ○ Isolation of stored energy (e.g. Lock Out Tag Out Procedures)
S8 Apply health, safety, and environmental procedures in compliance with regulations, standards, and guidance. For example, signage and barriers, working at height, confined spaces, and COSHH.	• Apply relevant health and safety legislation and regulations, such as: ○ Health and Safety at Work Act 1974 (HSWA) ○ Management of Health and Safety at Work Regulations 1999 ○ Workplace (Health, Safety and Welfare) Regulations 1992 ○ Personal Protective Equipment Regulations (PPE) 2022 (amended) ○ The Provision and Use of Work Equipment Regulations (PUWER) 1998 ○ Lifting Operations and Lifting Equipment Regulations (LOLER) ○ Manual Handling Operations Regulations 1992 ○ Electricity at Work Regulations 1989 ○ Electrical Equipment (Safety) Regulations 2016 ○ Confined Spaces Regulations 1997 ○ Working at Height Regulations 2005 ○ Control of Substances Hazardous to Health (COSHH) Regulations 2002

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013 ○ Health and Safety (First-Aid) Regulations 1981 • Apply environmental and waste management procedures, including: ○ Environmental Protection Act 1990 ○ Emergency response procedures (e.g. evacuation, first aid, fire safety) ○ Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 ○ Safe disposal of materials (e.g. stripping copper from motors) ○ Pollution prevention and resource efficiency • Use of safety systems and procedures: ○ Permit to Work (PTW) systems ○ Emergency response procedures (e.g. evacuation, first aid, fire safety) ○ Use of signage and barriers to control access and indicate hazards ○ Documentation and record-keeping to support compliance
S9 Follow security procedures. For example, site access, document classification, and securing assets.	▪ Access control and identification: ○ Use of security ID passes ○ Adhering to site access protocols and restricted area permissions ▪ Document and information security: ○ Securing tools, equipment and materials when not is use ○ Locking and monitoring storage areas and workspaces ▪ Technology-enables security measures: ○ Use of electronic security systems such as:

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	▪ Retina scans ▪ Fingerprint recognition ▪ Voice recognition ▪ Awareness of emerging technologies and AI based security systems • Reporting and escalation: ○ Following procedures for reporting security breaches or suspicious activity ○ Understanding the importance of timely communication and documentation
S12 Segregate items for reuse, recycling, and waste.	• Extracting materials, components or substances from maintenance tasks in a way that minimises damage and preserves potential reuse or recycling • Identifying and categorising items based on their suitability for: ○ Reuse (e.g. cleaned and inspected components) ○ Recycling (e.g. metals, plastics, electrical items) ○ Disposal (e.g. general waste, hazardous materials) • Segregating items into appropriate waste streams using: ○ Correct containers ○ Clear labelling ○ Safe and compliant storage methods • Ensuring reusable items are: ○ Cleaned

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance
	○ Inspected ○ Stored appropriately for future use • Transferring recyclable materials to: ○ Designated collection points ○ Authorised recycling facilities • Disposing of non-recyclable or hazardous waste in line with: ○ Duty of care requirements ○ Environmental legislation and company procedures • Maintaining records of: ○ Waste handling ○ Segregation activities ○ Disposal or recycling routes (where required)
B1 Prioritise safe working practices. For example, risk aware, minimise risks, and proactively work towards preventing accidents.	• Risk awareness and proactive safety conduct: ○ Identifying hazards and conducting risk assessments ○ Making informed decisions to reduce or eliminate risks ○ Taking personal responsibility for safety and quality ○ Exercising STOP work authority when unsafe conditions are identified • Application of safety procedures and controls: ○ Developing and following procedures and control measures ○ Using appropriate PPE ○ Applying emergency procedures (e.g. evacuation, first aid, electrocution response

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Observation with questions Theme and Core KSBs – Maintaining workplace health, safety, security, and environmental compliance	Amplification and Guidance

	• Competency and communication:
	  ○ Maintaining training and competency relevant to tasks
	  ○ Communicating clearly with colleagues and supervisors about safety concerns
	  ○ Participating in monitoring, supervision and safety briefings
	• Continuous improvement and learning:
	  ○ Reviewing incidents and near misses
	  ○ Applying lessons learned to improve future safety practices
	  ○ Contributing to updates of procedures and risk controls
	• Safe systems of work (SSoW):
	  ○ Standard Operating Procedures (SOPs)
	  ○ Permit to Work (PTW) Systems
	  ○ Safe Work Method Statements (SWMS)
	  ○ Risk Control Plans

Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
K19 Sources of engineering information.	• Technical documentation and reference materials: ○ Engineering drawings (hardcopy and electronic)

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Computer-Aided Design (CAD) 2D and 3D drawings and models (via laptops, tablets) ○ Work instructions, method statements, standard work procedures ○ Manufacturer's technical documentation and manuals ○ Design specifications, test results and performance data ○ Plant configurations and layout diagrams ○ Engineering reference tables (e.g. Zeus tables) • Professional and institutional sources: ○ Engineering Institutions such as Institution of Mechanical Engineers (IMechE) and Institution of Engineering and Technology (IET) ○ The Engineering Council and other regulatory or professional bodies • Emerging technologies and digital tools: ○ Augmented Reality (AR) for interactive 3D visualisation and guidance ○ Rapid prototyping tools and models for design validation and maintenance planning
K20 Engineering standards - British (BSI and International (ISO).	• British Standards Institution (BSI): ○ The UK's national standards body ○ Develops and publishes British Standards (BS) ○ Ensures alignment with UK legislation and industry best practice • International Organisation for Standardisation (ISO): ○ An independent, non-governmental international body

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Develops globally recognised standards (e.g. ISO9001 for quality management, ISO 14001 for environmental management) ○ Promotes international consistency and interoperability in engineering and manufacturing
K22 Quality management systems.	• Total Quality Management (TQM): A company wide approach focused on long-term success through customer satisfaction, involving all members of the organisation in improving processes, products and services • ISO 9001: An internationally recognised standard for quality management systems, setting out criteria for a systematic approach to managing quality and meeting customer regulatory requirements • Sector-specific standards: For example, BS EN 9100:2018 for the aerospace industry, which builds on ISO 9001 with additional requirements for safety, reliability and traceability • Continuous improvement methodologies: Lean management: Focused on reducing waste and increasing value in processes Six Sigma: A data driven approach to improving quality by identifying and eliminating defect and variability in processes

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance

K23 Standard operating procedures (SOP): what they are and why they are important.	• Structure and content of SOPs:
	  ○ Detailed written instructions
	  ○ Task-specific and structured formats
	  ○ Designed for consistency and repeatability
	• Purpose and benefits:
	  ○ Ensuring safety and reducing risk
	  ○ Promoting consistency and efficiency
	  ○ Supporting quality control and measurement
	  ○ Enabling accurate reporting and accountability
	  ○ Facilitating continuous improvement and lessons learnt reducing risk

K24 Foreign material exclusion requirements.	• Purpose of FME:
	  ○ Prevent introduction of debris, tools or other foreign objects into systems
	  ○ Maintain operational integrity and reliability
	• Impact on operations:
	  ○ Ensures precision in mechanical and electrical systems
	  ○ Protects safety of personnel and equipment
	  ○ Maintains product and service quality
	• Typical FME practice:
	  ○ Use of FME zones and barriers
	  ○ Tool and material accountability
	  ○ Inspection and clean-as-you-go protocols

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Documentation and reporting of FME incidents
S1 Review and use information. For example, work instructions, drawings, design specifications, and plant configurations.	• Technical documentation: ○ Work instructions, methods statements, Standard Operating Procedures (SOPs), Standard Work ○ Manufacturer's manuals and technical documentation ○ Design specifications, test results and engineering standards ○ Plan configurations and Zeus tables • Drawings and models: ○ Hardcopy and electronic engineering drawings ○ Computer-Aided Design (CAD) 2D and 3D models ○ Rapid prototypes and visualisation tools • Digital and emerging technologies: ○ Use of tablets, laptops and mobile devises for accessing technical data ○ Augmented Reality (AR)and other immersive technologies for 3D visualisation • Professional resources: ○ Engineering institutions such as the Institution of Mechanical Engineers (IMechE) and Institution of Engineering and Technology (IET) ○ The Engineering Council and its role in professional standards
S5 Identify equipment to work on. Check plant configuration is as defined.	• Identification of equipment:

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Locate and confirm the correct asset or system based on work instructions or maintenance schedules ○ Cross-reference equipment tags, serial numbers or asset registers • Vehicle of plant configuration: ○ Check that the plant setup matches the defined configuration in technical documentation ○ Confirm alignment with design specifications, schematics or system diagrams ○ Validate that any recent changes or updates have been documented and approved • Use of supporting documentation: ○ Review work orders, maintenance schedules and configuration records ○ Liaise with supervisors or technical teams if discrepancies are found
S6 Prepare the work area for maintenance tasks.	• Work preparation: ○ Confirm job allocation and responsibilities ○ Review and organise relevant documentation (e.g. work orders, risk assessments) • Resource readiness: ○ Gather and check tools and equipment, including PPE ○ Ensure availability of power tools and power supply ○ Prepare spare components and consumables required for the task • Safety and access control:

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Conduct and apply risk assessments ○ Confirm access arrangements and working boundaries ○ Implement isolation procedures for electrical and mechanical systems ○ Apply Lock Out Tag Out (LOTO) protocols using padlocks, keys and tags ○ Set up signs and physical barriers to cordon off the area and provide appropriate warning signage
S14 Apply engineering maintenance standards and procedures.	• Documentation and planning: ○ Review plant layout, technical documentation and maintenance procedures ○ Interpret engineering standards and apply them to specific tasks • Inspection and verification: ○ Conduct physical inspections of the work area and equipment ○ Review control system configurations and settings ○ Perform functional testing to confirm correct operation • Compliance and collaboration: ○ Check alignment with relevant regulations, standards and organisational procedures ○ Consult with operational and maintenance staff to confirm requirements and resolve discrepancies

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance

S15 Apply foreign material exclusion procedures.	• Contamination control:
	  ○ Apply procedures to prevent introduction of debris, tools or foreign materials
	  ○ Conduct cleaning and containment activities before, during and after maintenance
	• Cross- contamination prevention:
	  ○ Use colour coding systems for tools and materials
	  ○ Maintain designated clean areas and separate storage zones
	  ○ Apply clear labelling to identify and segregate items
	• Tool and equipment management:
	  ○ Exclude non-essential tools and equipment from FME zones
	  ○ Account for all items before and after task completion
	• Physical controls:
	  ○ Use barriers, covers and isolation techniques to protect sensitive systems
	  ○ Implement FEM checklist and documentation protocols

S16 Follow maintenance tools and equipment control procedures. For example, handling and storage.	• Storage and identification:
	  ○ Use correct labelling and coding systems
	  ○ Store tools and equipment appropriately (e.g. toolboxes, cabinets, racks, drawers)
	• Condition and safety:
	  ○ Inspect and maintain tools and equipment regularly

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Handle and operate tools safely using appropriate techniques ○ Use PPE as required • Compliance and control: ○ Undertake training and competency checks for tool use ○ Apply calibration, quarantine and testing procedures (e.g. Portable Appliance Testing - PAT) ○ Disposal of obsolete or damaged equipment in line with organisational and environmental procedures ○ Follow recycling protocols where applicable ○ Apply control procedures for lifting equipment, including coding and inspection
S17 Reinstate the work area.	• Work area reinstatement: ○ Remove tools, equipment and temporary barriers ○ Clean surfaces and ensure the area id free from debris or contamination ○ Restore any systems or services that were isolated during maintenance • Waste management: ○ Identify and segregate waste types (recyclable, non-recyclable and hazardous) ○ Dispose of waste in accordance with environmental regulations and company procedures

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
	○ Use appropriate containers and labelling for hazardous materials • Final checks: ○ Confirm the area is safe for operational use ○ Complete any required documentation or handover reports
S23 Identify and highlight issues (red pen) with drawings as found.	• Issue identification: ○ Detect inaccuracies, errors or omissions in technical documentation ○ Review drawings and specifications against actual conditions or updated requirements • Mark-up and communication: ○ Apply red pen or digital markup procedures in line with company standards ○ Ensure annotations are clear, traceable and appropriately documented ○ Communicate identified issues to relevant personnel (e.g. design, engineering or maintenance teams) • Documentation types: ○ Engineering drawings (hardcopy and digital) ○ CAD models (2D and 3D) ○ Technical specifications and design documents
B3 Take ownership for the delivery and quality of own work. For example, self-motivated, disciplined in the approach to	• Responsibility and discipline: ○ Understand and manage the scope of assigned maintenance tasks

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Observation with questions Theme and Core KSBs – Using work information and following working practices	Amplification and Guidance
work tasks, and work carried out in line with standards.	○ Follow relevant regulations, safety standards and operational procedures • Quality and compliance: ○ Use tools and equipment correctly and safely ○ Perform inspection, testing and monitoring activities with attention to detail ○ Maintain quality and compliance throughout the task lifecycle • Self-management and improvement: ○ Set and manage priorities effectively ○ Conduct and apply risk assessments ○ Communicate appropriately before and during work activities ○ Record measurements, test results and reports accurately ○ Engage in self-evaluation and seek feedback to improve performance

Observation with questions Theme and Core KSBS – Completing work records	Amplification and Guidance
K25 Documentation requirements: documentation control, auditable records.	○ Documentation control: ○ Accessing the correct issue/version of documentation ○ Checking document status and validity ○ Understanding access permissions and security protocols

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Observation with questions Theme and Core KSBS – Completing work records	Amplification and Guidance
	○ Retention periods and archiving procedures ○ Auditable records: ○ Work orders and maintenance requests ○ Inspection and testing records ○ Maintenance and action logs ○ Concessions (e.g. limitations of use) ○ Corrective maintenance records ○ Parts and materials usage ○ Health and safety compliance records ○ Regulatory compliance documentation ○ Asset management records ○ Training and competency records ○ Compliance: ○ Adherence to internal documentation standards ○ Compliance with relevant regulatory and legal requirements
S21 Record information	• Maintenance documentation: ○ Record dates, times and types of failure (e.g. corrective maintenance, breakdown log) ○ Complete inspection sheets and equipment condition reports ○ Document types of predictive maintenance used, parts replace and consumables used ○ Log test results, corrective actions taken and lessons learned • Completion and verification:

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Observation with questions Theme and Core KSBS – Completing work records	Amplification and Guidance
	○ Confirm task completion and sign-off as per company protocols ○ Record repair vs replace decisions, including cost, lead-time and downtime analysis • Compliance and safety: ○ Ensure records reflect health and safety measures taken ○ Maintain documentation to support regulatory compliance and audit requirements

Observation with questions Theme and Core KSBs – Communicating with others	Amplification and Guidance
K29 Verbal communication methods and techniques. Engineering maintenance terminology.	• Verbal communication methods and techniques: ○ Clear verbal instructions – Deliver concise and accurate spoken instructions, especially in noisy, time-sensitive or safety-critical environments ○ Tone and clarity – Use appropriate tone, pace and volume to ensure messages are understood across diverse teams and settings ○ Active listening – Demonstrate attentive listening and appropriate verbal responses to confirm understanding and encourage collaboration

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Observation with questions Theme and Core KSBs – Communicating with others	Amplification and Guidance
	○ Verbal briefings and handovers – Conduct effective verbal briefings, shift handovers and toolbox talks to ensure continuity and shared understanding ○ Questioning and feedback – Use open and closed questions to clarify information and provide constructive verbal feedback during maintenance activities Engineering maintenance terminology: • Common terms – Understand key concepts such as preventive maintenance, corrective maintenance, predictive maintenance and reliability-centred maintenance • Equipment-specific vocabulary – Be familiar with terms related to systems and components such as bearings, couplings, lubrication and alignment • Technical documentation – Interpret manuals, schematics and maintenance logs; understand the importance of accurate verbal reporting of findings and actions • Industry standards – Recognise relevant standards and regulations, including those from the British Standards Institution (BSI) and the Health and Safety Executive (HSE) • Stakeholder communication – Communicate technical information clearly and verbally to non-technical stakeholders, ensuring understanding and transparency

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Observation with questions Theme and Core KSBs – Communicating with others	Amplification and Guidance

S19 Communicate with others to give and receive information. For example, colleagues, customers, and stakeholders.	• Audience awareness:
	  ○ Understand the needs and expectations of different audiences (e.g. technical vs non-technical)
	  ○ Tailor messaging to suit the context and recipient
	• Communication techniques:
	  ○ Deliver clear and concise verbal and written messaging
	  ○ Use active listening to understand instructions, feedback and concerns
	  ○ Apply non-verbal communication appropriately (e.g. body language, eye contact)
	• Channels and tools:
	  ○ Select appropriate communication channels (e.g. face to face, email, phone) based on urgency and context
	  ○ Maintain accurate documentation and records of communication where required
	• Professional conduct
	  ○ Communicate respectfully and professionally at all times
	  ○ Use feedback mechanisms to support continuous improvement
	  ○ Collaborate effectively with others to support task completion and problem-solving

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

Electrical and control and instrumentation engineering maintenance technician.
 	
K34 Electrical isolation and de-isolation requirements: lockout tagout and testing for dead.
	• Preparation and authorisation:
	  ○ Identify all sources of electrical energy (e.g. mains, backup systems, stored energy)
	  ○ Notify all personnel affected by the isolation process
	  ○ Ensure only authorised personnel carry out isolation and de-isolation activities
	• Isolation procedures:
	  ○ Isolate equipment from all energy sources
	  ○ Apply lockout devices (may involve multiple locks for team isolation)
	  ○ Attach warning tags (Tagout) to clearly indicate isolation status
	• Testing and verification:
	  ○ Test for dead using approved and calibrated test equipment
	  ○ Confirm zero energy before commencing work
	  ○ Includes isolation of control circuits, instrumentation loops ad low-voltage systems where applicable
	• De-isolation and re-energisation :
	  ○ Remove lockout/tagout devices following correct procedures
	  ○ Re-energise equipment safely and conduct appropriate testing
	  ○ Communicate completion of de-isolation to affected personnel

Electrical and control and instrumentation engineering maintenance technician.	• Inspecting and testing: ○ Perform visual checks and functional tests

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
K41 Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.	○ Use appropriate test equipment to assess system performance and integrity • Component replacement: ○ Safely remove and replace electrical parts such as panels, motors, generators and control units ○ Follow procedures for handling and installing components • System setup and adjustment: ○ Configure and adjust electrical aspects of: ▪ Plant and control systems; Power distribution networks; Motors and drives; Lighting systems; Circuit protection systems; Earthing and grounding systems; Backup power systems ○ Includes configuration of control loops, instrumentation interfaces and signal processing units where applicable • Cleaning and maintenance: ○ Clean control panels, motors, switchgear, transformers, cables and wiring ○ Maintain cleanliness to prevent faults correct operation • Functional testing: ○ Conduct final tests to confirm correct operation ○ Ensure compliance with: ▪ Safety requirements ▪ Task specifications

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	▪ Company policies and procedures ▪ Personal and team responsibilities
Electrical and control and instrumentation engineering maintenance technician. **K42** Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.	• Tool and equipment selection: ○ Choose appropriate tools and test equipment based on task requirements ○ Understand the function and limitations of each device • Operation and setup: ○ Adjust device settings and measurement ranges as required ○ Carry out pre-use checks to confirm equipment functionality ○ Use tools and equipment in accordance with manufacturer instructions and company procedures • Care and maintenance: ○ Handle equipment safely and store correctly to prevent damage ○ Maintain calibration and cleanliness ○ Report faults and follow procedures for quarantine or repair • Examples of tools and test equipment may include: ○ Hand tools: screwdrivers, pliers, wire strippers, crimpers ○ Electrical test equipment: ▪ Multimeters/multifunction testers; Oscilloscopes; Ammeters/voltmeters; Megohmmeters/insulation resistance testers; Clamp meters; Earth resistance testers; Proving units; Battery testers; Circuit breaker testers; Thermal imaging camera

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	(thermography); Vibration analysers; Leakage current tester; Continuity tester; Dielectric strength tester; Voltage testers and indicators; Acoustic detection equipment ○ Instrumentation-specific tools may include signal generators, loop calibrators and process meters where applicable
Electrical and control and instrumentation engineering maintenance technician. **K46** Isolation and de-isolation of connected services considerations and requirements.	• Identify the services to be isolated: ○ Electrical power; Compressed air; Hydraulic pressure; Steam and other process fluids • Hazard and risk assessment: ○ Evaluate potential hazards associated with each service ○ Conduct risk assessments prior to isolation • Isolation devices and methods: ○ Use of valves and shut-off valves; Lockout Tagout (LOTO) systems; Pressure relief systems; Blanking plates and physical barriers • Mechanical and electrical de-energisation: ○ Isolate mechanical equipment and ensure zero energy state ○ Confirm isolation through testing and verification ○ Includes isolation of control signals, instrumentation loops and low-voltage systems where applicable • De-isolation procedures: ○ Confirm completion of maintenance and safety checks ○ Verify equipment condition and readiness

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Ensure personnel safety and remove all locks and tags ○ Maintain clear communication between involved personnel ○ Re-energise systems gradually and monitor performance ○ Conduct functional testing and commissioning ○ Complete maintenance records and documentation ○ Hand back equipment to production safely and effectively • Special considerations for hazardous materials: ○ Purge hazardous materials from systems ○ Ventilate the area to ensure safe working conditions • Use containment systems to prevent exposure or release
Electrical and control and instrumentation engineering maintenance technician. **K53** Control and instrumentation equipment and control systems maintenance requirements and methods: removing and replacing instruments and sensors, inspecting, testing, cleaning, setting up, calibration, and functional testing.	• Removing and replacing instruments and sensors: ○ Identify faulty or outdated components ○ Follow safe isolation procedures before removal ○ Select and install appropriate replacements ○ Ensure correct orientation, connection, and integration • Inspection of C&I equipment and control systems: ○ Visual and functional checks for wear, damage, or degradation ○ Use of diagnostic tools and techniques ○ Verification against technical specifications and tolerances • Testing of C&I equipment and control systems: ○ Perform electrical and signal integrity tests ○ Validate input/output responses

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Confirm system behaviour under normal and fault conditions ○ Includes electrical continuity, insultation resistance and voltage verification where applicable • Cleaning of C&I equipment and control systems: ○ Use appropriate cleaning agents and tools ○ Prevent contamination or damage to sensitive components ○ Maintain cleanliness standards for operational reliability • Setting up C&I equipment and control systems: ○ Configure parameters and control logic ○ Align sensors and actuators to required positions ○ Integrate with wider control systems and networks • Calibration of C&I equipment and control systems: ○ Adjust instruments to meet defined accuracy standards ○ Use calibration tools and reference standards ○ Record calibration data and ensure traceability • Functional testing of C&I equipment and control systems: ○ Simulate operational conditions to verify performance ○ Confirm correct interaction between system components • Document results and address any deviations
Electrical and control and instrumentation engineering maintenance technician.	• Tool and equipment selection: ○ Identify tools appropriate to the maintenance task

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
K54 Control and instrumentation maintenance tools and equipment application, operation, care, and calibration requirements.	○ Match tools to specific control and instrumentation system requirements ○ Consider environmental and safety factors when selecting tools • Functionality checks and operational use: ○ Inspect tools and equipment prior to use ○ Confirm operational readiness and calibration status ○ Use tools in line with manufacturer instructions and company procedures • Care and maintenance of tools: ○ Clean and store tools correctly to prevent damage or contamination ○ Perform routine maintenance and servicing ○ Report and replace damaged or faulty tools • Calibration requirements: ○ Understand calibration intervals and standards ○ Use certified calibration equipment and software ○ Record calibration data and maintain traceability • Types of tools and equipment may include: ○ PPE and safety tools ○ Hand tools (e.g. screwdrivers, spanners, pliers) ○ Measurement and diagnostic equipment (e.g. multimeters, oscilloscopes) ○ Signal generators and simulators

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Calibration and test equipment, including software-based tools ○ Control systems maintenance tools, such as: ▪ Programmable Logic Controller (PLC) programming tools ▪ Loop controllers and indicators ▪ SCADA interface tools • Actuator and valve maintenance tools • Electrical maintenance tools may include insulations testers, continuity testers, clamp meters and voltage indicators where applicable
Electrical and control and instrumentation engineering maintenance technician. **S27** Confirm safe electrical isolation (lockout tagout) method has been applied and test for dead.	• Preparation and authorisation: ○ Identify all sources of electrical energy (e.g. mains, stored energy, backup systems) ○ Notify all personnel affected by the isolation process ○ Ensure only authorised personnel are involved in isolation and de-isolation activities • Isolation procedures: ○ Isolate equipment from energy sources following approved methods ○ Apply lockout devices (may involve multiple locks for team isolation) ○ Attach warning tags (Tagout) to indicate isolation status • Testing for dead: ○ Use appropriate and calibrated test equipment to confirm zero energy ○ Follow company procedures for verifying safe conditions for verifying safe conditions before work begins

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Includes verification of control circuits, instrumentation loops and low-voltage systems where applicable • De-isolation and re-energisation : ○ Remove lockout/tagout devices in accordance with procedure ○ Re-energise equipment safely and conduct final testing ○ Communicate completion of de-isolation to relevant personnel
Electrical and control and instrumentation engineering maintenance technician. **S28** Select, check, and use electrical maintenance tools, measurement, and test equipment. Select, check, and use control and instrumentation maintenance tools, measurement, and test equipment.	• Selection and suitability: ○ Choose tools and test equipment appropriate for the task and environment ○ Understand the function and limitations of each device • Safety and functionality checks: ○ Confirm equipment is safe to use and in good working condition ○ Verify regulatory checks are current, including: ▪ Portable Appliance Testing (PAT) ▪ Calibration and certification • Operation and care: ○ Use tools and equipment in line with manufacturer instructions and company procedures ○ Handle and store equipment correctly to prevent damage ○ Report faults and follow procedures for quarantine or repair Example of tools and test equipment may include: • Hand tools: screwdrivers, pliers, wire strippers, crimpers

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	• Electrical test equipment: ○ Multimeters/multifunction testers; Oscilloscopes; Ammeters/voltmeters; Megohmmeters/insulation resistance testers; Clamp meters; Earth resistance testers; Proving units; Battery testers; Circuit breaker testers; Thermal imaging cameras (thermography); Vibration analysers; Leakage current testers; Continuity testers; Dielectric strength testers; Voltage testers and indicators and Acoustic detection equipment

Electrical and control and instrumentation engineering maintenance technician.
 	
S31 Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.
	• Sensory Inspection:
	  ○ Perform visual checks for signs of wear, damage or overheating
	  ○ Detect unusual smells (e.g. burning insulation), noises (e.g. humming, rattling) and vibrations
	• Electrical testing:
	  ○ Insulation resistance; Continuity; Bonding; Current and voltage levels; Resistance and phase unbalance; Dielectric strength; Earth resistance; Load conditions; Residual Current Device (RCD) functionality; Earth loop impedance
	• Advanced diagnostics:
	  ○ Conduct thermographic surveys using thermal imaging equipment
	  ○ Interpret test results to identify faults and recommend corrective actions

Electrical and control and instrumentation engineering maintenance technician.	• Removal and replacement of electrical items and components in line with: ○ Relevant health and safety regulations

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
S32 Remove and replace electrical parts.	○ Company policies and procedures ○ Manufacturer instructions ○ Job role and sector-specific requirements
Electrical and control and instrumentation engineering maintenance technician. **S34** Set up and adjust electrical aspects of plant.	• Installation and setup: ○ Install electrical equipment and components in line with specifications ○ Carry out wiring and cabling task, including selection of cable types and routing ○ Perform electrical terminations using appropriate methods and materials ○ Conduct tug tests to verify secure connections • Alignment of electrical systems and components: ○ Align sensors, actuators and control devices to ensure correct positioning and signal accuracy ○ Align electrical enclosures, panels and fixtures to meet mechanical and electrical tolerances ○ Use test instruments (e.g. multimeters, oscilloscopes) to verify alignment of voltage, current and signal parameters ○ Ensure alignment supports system integration, minimises interference and meets operational requirements • Adjustment and commissioning: ○ Commission electrical plant and systems to confirm correct operation ○ Check and adjust protection devices (e.g. circuit breakers, RCDs)

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Configure and fine-tune control systems and voltage settings ○ Adjust frequency drives and other programmable devices • Maintenance and optimisation: ○ Lubricate, clean and tighten electrical components and connections ○ Ensure all adjustments comply with relevant safety standards and company procedures
Electrical and control and instrumentation engineering maintenance technician. **S35** Clean parts. For example, removal of dust and debris.	• Cleaning electrical components and equipment such as: ○ Panels ○ Switchgear ○ Distribution boards ○ Ventilation grills and ducts • Cleaning instrumentation components such as: ○ Sensors ○ Transmitters ○ Control devices and signal converters • Cleaning instrumentation enclosures: ○ Remove accumulated dust or moisture ○ Check for ingress of contaminants and clean accordingly ○ Ensure seals and covers are intact after cleaning • Cleaning electrical contacts and connectors: ○ Use suitable contact cleaners and tools ○ Ensure no residue or contamination remains

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Avoid damage to pins, sockets, or insulation • Cleaning pipelines and flow paths: ○ Remove blockages or build-up in flow measurement systems ○ Use flushing or purging methods where appropriate ○ Ensure cleanliness does not compromise calibration or accuracy • Cleaning wiring and connections: ○ Remove dust and debris from wiring terminals and cable trays ○ Ensure labels and identification remain legible ○ Avoid disturbing connections or introducing faults during cleaning Following: • Relevant safety protocols before starting the task • Correct cleaning procedures • Appropriate precautions to prevent damage or risk • Suitable techniques for the type of component and contamination • Manufacturer guidance for cleaning delicate or precision parts
Electrical and control and instrumentation engineering maintenance technician.	• Identify the services to be isolated: ○ Electrical power ○ Compressed air ○ Hydraulic pressure ○ Steam • Assessment of hazards and risks: ○ Evaluate potential hazards associated with each service

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
S36 Conduct and confirm electrical and connected services and isolation and de-isolation.	○ Conduct risk assessments prior to isolation • Isolation devices and methods: ○ Use of valves and shut-off valves ○ Lockout Tagout (LOTO) systems ○ Pressure relief systems ○ Blanking plates and physical barriers • Mechanical and electrical de-energisation: ○ Isolate mechanical equipment and ensure a zero-energy state ○ Confirm isolation through appropriate testing and verification • Pre-de-isolation checks ○ Confirm completion of all maintenance tasks and safety checks ○ Verify equipment condition and readiness for operation ○ Ensure personnel safety and awareness of de-isolation activities • De-isolation procedures: ○ Remove all locks and tags applied during isolation (LOTO) ○ Maintain clear communication between all personnel involved ○ Confirm system readiness for re-energisation • Re-energisation and verification: ○ Re-energise the system gradually and monitor for abnormalities ○ Conduct functional testing and commissioning checks ○ Complete maintenance records and documentation • Handover and return to service:

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Follow reporting and handover procedures ○ Ensure the system is returned to normal operational status
Electrical and control and instrumentation engineering maintenance technician **S37** Conduct functional testing.	• System re-energisation: ○ Follow approved procedures to re-energise equipment safely ○ Monitor system during start-up for any irregularities • Functional testing: ○ Perform functional tests to confirm that equipment and systems operate as expected ○ Use appropriate test equipment and methods based on system type and task requirements • Verification and documentation: ○ Confirm operational status and system stability ○ Complete maintenance records accurately ○ Notify relevant personnel that equipment is operational • Handover: ○ Follow handover procedures to ensure clear communication of task completion ○ Provide relevant information to stakeholders or operational teams
Electrical and control and instrumentation engineering maintenance technician	• Visual inspection: ○ Check for signs of wear, damage, corrosion, or contamination ○ Verify correct installation and physical integrity of components

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

S38 Inspect and test control and instrumentation systems.	• Functional testing:
	  ○ Confirm that instruments and control systems operate as intended
	  ○ Simulate inputs and observe system responses
	• Calibration:
	  ○ Adjust instruments to meet defined accuracy standards
	  ○ Use appropriate calibration tools and reference values
	  ○ Record calibration results and ensure traceability
	• Loop checking and verification:
	  ○ Confirm signal integrity and continuity across control loops
	  ○ Verify correct operation of transmitters, controllers, and actuators
	• Electrical safety testing:
	  ○ Perform insulation resistance and earth continuity tests
	  ○ Ensure compliance with electrical safety standards
	• Functional and performance testing of control systems:
	  ○ Validate system behaviour under normal and fault conditions
	  ○ Confirm correct sequencing, interlocks, and alarms
	• Communication and data integrity testing:
	  ○ Check signal transmission and data accuracy across networks
	  ○ Verify communication protocols and interface functionality
	• Vibration and mechanical testing:
	  ○ Assess mechanical stability and identify sources of vibration
	  ○ Use vibration analysis tools where applicable

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

	• Functional safety testing:
	  ○ Test safety-related control functions (e.g. emergency shutdown systems)
	  ○ Confirm compliance with safety integrity level (SIL) requirements
	• Environmental testing:
	  ○ Evaluate system performance under environmental conditions such as temperature, humidity, or dust
	• Ensure equipment is suitable for its operating environment

Electrical and control and instrumentation engineering maintenance technician
 	
S39 Check calibration and make adjustments.
	• Check calibration status:
	  ○ Verify calibration dates and certification
	  ○ Inspect instruments for signs of drift or inaccuracy
	  ○ Use appropriate reference standards and calibration tools
	• Perform calibration checks:
	  ○ Compare instrument readings against known values
	  ○ Follow manufacturer and company calibration procedures
	  ○ Record results and identify any deviations from acceptable limits
	• Make adjustments:
	  ○ Adjust instruments to bring them within specified tolerances
	  ○ Use correct tools and software for adjustment
	  ○ Ensure adjustments do not compromise system integrity or safety
	• Post-calibration verification:
	  ○ Re-check instrument performance after adjustment

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Confirm accuracy and repeatability of readings ○ Document calibration results and update records • Compliance and traceability: ○ Ensure all calibration activities meet regulatory and organisational standards • Maintain traceable records for audit and quality assurance purposes
Electrical and control and instrumentation engineering maintenance technician **S40** Check loop function.	• Verify signal transmission: ○ Confirm that signals are transmitted correctly from sensors to the control system ○ Check for signal integrity, continuity, and correct scaling • Check control loop operation: ○ Ensure the control loop operates within specified parameters ○ Observe system response to setpoint changes and disturbances ○ Identify and resolve issues such as oscillation, lag, or instability • Confirm actuator response: ○ Verify that actuators respond appropriately to control signals ○ Check for correct direction, speed, and range of movement ○ Ensure feedback signals are accurate and consistent • Loop documentation and traceability: ○ Refer to loop diagrams and control system documentation ○ Record test results and any adjustments made ○ Ensure compliance with commissioning or maintenance procedures

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

	• Use of appropriate tools and equipment:
	  ○ Apply signal generators, simulators, and diagnostic tools
	  ○ Use calibration and test equipment where required
	• Follow safety procedures and use appropriate PPE

Electrical and control and instrumentation engineering maintenance technician
 	
S41 Set up and adjust control and instrumentation systems.
	• Install and mount equipment:
	  ○ Position and secure instruments, sensors, and control devices
	  ○ Ensure correct orientation, alignment, and environmental protection
	• Configure and set parameters in control systems:
	  ○ Input and adjust control parameters (e.g. setpoints, ranges, alarm limits)
	  ○ Configure communication settings and device addresses
	  ○ Integrate devices into control networks and systems
	• Commission control loops:
	  ○ Verify loop integrity and correct signal flow
	  ○ Test loop functionality under simulated and live conditions
	  ○ Confirm correct interaction between sensors, controllers, and actuators
	• Calibrate instruments and devices:
	  ○ Use appropriate calibration tools and reference standards
	  ○ Adjust devices to meet required accuracy and performance
	  ○ Record calibration results and ensure traceability
	• Test system functionality:
	  ○ Perform functional and performance testing of the complete system

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Validate system behaviour under normal and fault conditions ○ Identify and resolve any issues or inconsistencies • Fine-tuning and adjustments: ○ Optimise control parameters for stability and responsiveness ○ Adjust for process-specific requirements or environmental factors ○ Ensure system operates within defined tolerances • Documentation and handover: ○ Complete setup and calibration records ○ Update system documentation and configuration files • Communicate system status and hand over to operations or production teams
Electrical and control and instrumentation engineering maintenance technician **S42** Remove and replace instruments and sensors.	• Identify and work with common control and instrumentation equipment: ○ Sensors and transducers: ▪ Temperature sensors ▪ Pressure sensors ▪ Flow meters ▪ Level sensors ▪ Position and motion sensors • Controllers and process control systems: ○ Programmable Logic Controllers (PLCs) ○ Distributed Control Systems (DCS) ○ Supervisory Control and Data Acquisition (SCADA) systems ○ Human-Machine Interfaces (HMI)

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

	• Actuators and final control elements:
	  ○ Valves and actuators
	  ○ Motors and drives
	  ○ Relays and contactors
	• Communication and networking equipment:
	  ○ Industrial communication protocols (e.g. Modbus, Profibus, Ethernet/IP)
	  ○ Wireless and Internet of Things (IoT) sensors
	• Removal procedures:
	  ○ Isolate equipment and ensure safe working conditions
	  ○ Disconnect wiring, tubing, or mounting hardware as required
	  ○ Handle components carefully to avoid damage or contamination
	• Replacement procedures:
	  ○ Select correct replacement parts based on specification and compatibility
	  ○ Install and connect new instruments or sensors securely and accurately
	  ○ Ensure correct orientation, calibration status, and integration with control systems
	• Post-installation checks:
	  ○ Verify correct operation of replaced components
	  ○ Perform functional testing and calibration if required
	• Update documentation and maintenance records

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance

Electrical and control and instrumentation engineering maintenance technician
 	
S43 Re-connect instrumentation power supply, cables, pipework, and services.
	• Follow relevant safety procedures and regulations:
	  ○ Comply with health, safety, and environmental requirements
	  ○ Apply safe isolation and lockout/tagout procedures where necessary
	  ○ Use appropriate personal protective equipment (PPE)
	• Adhere to company policies and procedures:
	  ○ Follow organisational standards for reconnection tasks
	  ○ Ensure documentation and permits are in place where required
	• Use correct tools and equipment:
	  ○ Select and use appropriate tools for electrical, pneumatic, or hydraulic reconnections
	  ○ Inspect tools for condition and suitability before use
	• Follow manufacturer guidelines:
	  ○ Refer to technical manuals and datasheets for correct reconnection methods
	  ○ Ensure compatibility of components and connections
	• Re-connect services safely and effectively:
	  ○ Reconnect power supplies, signal cables, and communication lines
	  ○ Reconnect pipework for air, fluid, or gas services
	  ○ Check for correct polarity, continuity, and sealing
	  ○ Secure all connections to prevent leaks, faults, or interference
	• Post-reconnection checks:
	  ○ Inspect and test all reconnected systems for correct operation

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Observation with questions Theme and Specialist option KSBs – Conducting planned electrical and control and instrumentation maintenance	Amplification and Guidance
	○ Verify system integrity and safety before re-energisation • Complete documentation and handover procedures

Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
Electrical and mechanical engineering maintenance technician. **K58** Electrical isolation and de-isolation requirements: lockout tagout, testing for dead.	• Identify the services to be isolated: ○ Electrical power ○ Compressed air ○ Hydraulic pressure ○ Steam and other process fluids • Hazard and risk assessment: ○ Evaluate potential hazards associated with each service ○ Conduct risk assessments prior to isolation • Isolation devices and methods: ○ Use of valves and shut-off mechanisms ○ Lockout Tagout (LOTO) systems ○ Pressure relief systems ○ Blanking plates and physical barriers • Mechanical and electrical de-energisation:

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Isolate mechanical equipment and ensure a zero-energy state ○ Confirm isolation though appropriated testing and verification • De-isolation procedures: ○ Confirm completion of maintenance and safety checks ○ Verify equipment condition and readiness ○ Ensure personnel safety and remove all locks and tags ○ Maintain clear communication among all involved personnel ○ Re-energise systems gradually and monitor performance ○ Conduct functional testing and commissioning ○ Complete maintenance records and documentation ○ Safely and effectively hand back equipment to production • Special considerations for hazardous materials: ○ Purge hazardous materials from systems ○ Ventilate the area to ensure safe working conditions ○ Use containment systems to prevent exposure or release
Electrical and mechanical engineering maintenance technician. **K65** Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting,	• Inspecting and testing: ○ Perform visual checks and functional tests ○ Use appropriate test equipment to assess system performance and integrity • Component replacement: ○ Safely remove and replace electrical parts such as panels, motors, generators and control units

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
testing, setting up, adjusting, cleaning, and functional testing.	○ Follow procedures for handling and installing components ○ Includes mechanical interfaces such as couplings, mountings and drive assemblies where applicable • System setup and adjustment: ○ Configure and adjust electrical aspects of: ▪ Plant and control systems; Power distribution networks; Motors and drives; Lighting systems; Circuit protection systems; Earthing and grounding systems; Backup power systems • Cleaning and maintenance: ○ Clean control panels, motors, switchgear, transformers, cables and wiring ○ Maintain cleanliness to prevent faults correct operation • Functional testing: ○ Conduct final tests to confirm correct operation ○ Ensure compliance with: ▪ Safety requirements ▪ Task specifications ▪ Company policies and procedures • Personal and team responsibilities
Electrical and mechanical engineering maintenance technician.	• Tool and equipment selection: ○ Choose appropriate tools and test equipment based on task requirements

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
K66 Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.	○ Understand the function and limitations of each device • Operation and setup: ○ Adjust device settings and measurement ranges as required ○ Carry out pre-use checks to confirm equipment functionality ○ Use tools and equipment in accordance with manufacturer instructions and company procedures • Care and maintenance: ○ Handle equipment safely and store correctly to prevent damage ○ Maintain calibration and cleanliness ○ Report faults and follow procedures for quarantine or repair • Examples of tools and test equipment may include: ○ Hand tools: screwdrivers, pliers, wire strippers, crimpers ○ Electrical test equipment: • Multimeters/multifunction testers; Oscilloscopes; Ammeters/voltmeters; Megohmmeters/insulation resistance testers; Clamp meters; Earth resistance testers; Proving units; Battery testers; Circuit breaker testers; Thermal imaging camera (thermography); Vibration analysers; Leakage current tester; Continuity tester; Dielectric strength tester; Voltage testers and indicators; Acoustic detection equipment
Electrical and mechanical engineering maintenance technician.	• Identify the services to be isolated: ○ Electrical power; Compressed air; Hydraulic pressure; Steam and other process fluids

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance

K70 Isolation and de-isolation of connected services: considerations and requirements.	• Hazard and risk assessment:
	  ○ Evaluate potential hazards associated with each service
	  ○ Conduct risk assessments prior to isolation
	• Isolation devices and methods:
	  ○ Use of valves and shut-off valves; Lockout Tagout (LOTO) systems; Pressure relief systems; Blanking plates and physical barriers
	• Mechanical and electrical de-energisation:
	  ○ Isolate mechanical equipment and ensure zero energy state
	  ○ Confirm isolation through testing and verification
	• De-isolation procedures:
	  ○ Confirm completion of maintenance and safety checks
	  ○ Verify equipment condition and readiness
	  ○ Ensure personnel safety and remove all locks and tags
	  ○ Maintain clear communication between involved personnel
	  ○ Re-energise systems gradually and monitor performance
	  ○ Conduct functional testing and commissioning
	  ○ Complete maintenance records and documentation
	  ○ Hand back equipment to production safely and effectively
	• Special considerations for hazardous materials:
	  ○ Purge hazardous materials from systems
	  ○ Ventilate the area to ensure safe working conditions
	• Use containment systems to prevent exposure or release

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
Electrical and mechanical engineering maintenance technician. **K74** Mechanical maintenance requirements and techniques: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and lubricating.	• Checking the condition and operation of mechanical aspects of plant and equipment • Removing and replacing mechanical parts • Examining mechanical parts for defects • Setting up and adjusting mechanical aspects of plant • Cleaning parts • Lubricating mechanical assemblies • The apprentice should also know how to correctly carry out functional testing to confirm correct operation in line with task requirements.

Electrical and mechanical engineering maintenance technician.
 	
K75 Mechanical maintenance tools and equipment application, operation, care, and calibration requirements.
	• Operation, care and calibration of mechanical maintenance tools and equipment
	• Complying with all health and safety and regulatory measures required
	• Types of tools and equipment may include:
	  ○ Hand tools
	  ○ Power tools
	  ○ Measuring and testing tools
	• Lifting and handling equipment

Electrical and mechanical engineering maintenance technician.	• Preparation and authorisation:
	  ○ Identify all sources of electrical energy (e.g. mains, stored energy, backup systems)
	  ○ Notify all personnel affected by the isolation process

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
S44 Confirm safe electrical isolation (lockout tagout) method has been applied and test for dead.	○ Ensure only authorised personnel are involved in isolation and de-isolation activities • Isolation procedures: ○ Isolate equipment from energy sources following approved methods ○ Apply lockout devices (may involve multiple locks for team isolation) ○ Attach warning tags (Tagout) to indicate isolation status ○ Includes isolation of electrically powered mechanical systems such as motor, actuators and control linked devices where applicable • Testing for dead: ○ Use appropriate and calibrated test equipment to confirm zero energy ○ Follow company procedures for verifying safe conditions for verifying safe conditions before work begins • De-isolation and re-energisation : ○ Remove lockout/tagout devices in accordance with procedure ○ Re-energise equipment safely and conduct final testing • Communicate completion of de-isolation to relevant personnel
Electrical and mechanical engineering maintenance technician.	• Identify the services to be isolated: ○ Electrical power ○ Compressed air ○ Hydraulic pressure ○ Steam • Assessment of hazards and risks:

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
S45 Conduct and confirm electrical and connected services and isolation and de-isolation.	○ Evaluate potential hazards associated with each service ○ Conduct risk assessments prior to isolation • Isolation devices and methods: ○ Use of valves and shut-off valves ○ Lockout Tagout (LOTO) systems ○ Pressure relief systems ○ Blanking plates and physical barriers • Mechanical and electrical de-energisation: ○ Isolate mechanical equipment and ensure a zero-energy state ○ Confirm isolation through appropriate testing and verification ○ Includes isolation of electrically powered mechanical systems such as motors, actuators and fluid power systems where applicable • Pre-de-isolation checks ○ Confirm completion of all maintenance tasks and safety checks ○ Verify equipment condition and readiness for operation ○ Ensure personnel safety and awareness of de-isolation activities • De-isolation procedures: ○ Remove all locks and tags applied during isolation (LOTO) ○ Maintain clear communication between all personnel involved ○ Confirm system readiness for re-energisation • Re-energisation and verification: ○ Re-energise the system gradually and monitor for abnormalities

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Conduct functional testing and commissioning checks ○ Complete maintenance records and documentation • Handover and return to service: ○ Follow reporting and handover procedures • Ensure the system is returned to normal operational status
Electrical and mechanical engineering maintenance technician. **S46** Select, check, and use electrical and mechanical maintenance tools, measurement and test equipment.	• Selection and suitability: ○ Choose tools and test equipment appropriate for the task and environment ○ Understand the function and limitations of each device • Safety and functionality checks: ○ Confirm equipment is safe to use and in good working condition ○ Verify regulatory checks are current, including: ▪ Portable Appliance Testing (PAT) ▪ Calibration and certification • Operation and care: ○ Use tools and equipment in line with manufacturer instructions and company procedures ○ Handle and store equipment correctly to prevent damage ○ Report faults and follow procedures for quarantine or repair • Example of tools and test equipment may include: ○ Hand tools: screwdrivers, pliers, wire strippers, crimpers ○ Power tools

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Measuring and testing tools ○ Lifting and handling equipment ○ Electrical test equipment: ○ Multimeters/multifunction testers; Oscilloscopes; Ammeters/voltmeters; Megohmmeters/insulation resistance testers; Clamp meters; Earth resistance testers; Proving units; Battery testers; Circuit breaker testers; Thermal imaging cameras (thermography); Vibration analysers; Leakage current testers; Continuity testers; Dielectric strength testers; Voltage testers and indicators and Acoustic detection equipment
Electrical and mechanical engineering maintenance technician. **S49** Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.	• Sensory Inspection: ○ Perform visual checks for signs of wear, damage or overheating ○ Detect unusual smells (e.g. burning insulation), noises (e.g. humming, rattling) and vibrations • Electrical testing: ○ Insulation resistance; Continuity; Bonding; Current and voltage levels; Resistance and phase unbalance; Dielectric strength; Earth resistance; Load conditions; Residual Current Device (RCD) functionality; Earth loop impedance • Advanced diagnostics: ○ Conduct thermographic surveys using thermal imaging equipment • Interpret test results to identify faults and recommend corrective actions

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance

Electrical and mechanical engineering maintenance technician.
 	
S50 Remove and replace electrical parts.
	• Removal and replacement of electrical items and components in line with:
	  ○ Relevant health and safety regulations
	  ○ Company policies and procedures
	  ○ Manufacturer instructions
	• Preparation and isolation:
	  ○ Identify and isolate all relevant energy sources (e.g. mains, stored energy, control circuits)
	  ○ Apply lockout/tagout procedures and test for dead before commencing work
	• Component handling and installation:
	  ○ Safely remove electrical components such as motors, panels, sensors, control units, and wiring
	  ○ Select appropriate replacement parts based on specifications and compatibility
	  ○ Ensure correct orientation, connection, and mechanical fit
	  ○ Use appropriate tools and techniques to avoid damage to components or surrounding systems
	• Job role and sector-specific requirements:
	  ○ Includes removal and replacement of electrically powered mechanical systems (e.g. motor-driven pumps, actuators)
	  ○ Consider environmental factors such as moisture, vibration, and temperature during installation

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Maintain documentation and communicate completion of task to relevant personnel
Electrical and mechanical engineering maintenance technician. **S52** Set up, align and adjust electrical aspects of plant.	• Installation and setup: ○ Install electrical equipment and components in line with specifications ○ Carry out wiring and cabling task, including selection of cable types and routing ○ Perform electrical terminations using appropriate methods and materials ○ Conduct tug tests to verify secure connections • Alignment of electrical systems and components: ○ Align sensors, actuators and control devices to ensure correct positioning and signal accuracy ○ Align electrical enclosures, panels and fixtures to meet mechanical and electrical tolerances ○ Use test instruments (e.g. multimeters, oscilloscopes) to verify alignment of voltage, current and signal parameters ○ Ensure alignment supports system integration, minimises interference and meets operational requirements ○ Includes alignment of electrically powered mechanical systems such as motor shafts, actuators and drive couplings where applicable • Adjustment and commissioning: ○ Commission electrical plant and systems to confirm correct operation

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Check and adjust protection devices (e.g. circuit breakers, RCDs) ○ Configure and fine-tune control systems and voltage settings ○ Adjust frequency drives and other programmable devices • Maintenance and optimisation: ○ Lubricate, clean and tighten electrical components and connections ○ Ensure all adjustments comply with relevant safety standards and company procedures
Electrical and mechanical engineering maintenance technician. **S53** Clean parts. For example, removal of dust and debris.	• Cleaning electrical components and equipment such as: ○ Panels ○ Switchgear ○ Distribution boards ○ Ventilation grills and ducts • Cleaning mechanical components and assemblies such as: ○ Bearings, shafts, couplings, gearboxes, and housings ○ Hydraulic and pneumatic system components ○ Mechanical seals and gaskets Following: • Relevant safety protocols before starting the task • Correct cleaning procedures • Manual cleaning using brushes, cloths, and compressed air • Use of cleaning agents and equipment such as: ○ Solvents and detergents

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Ultrasonic cleaning systems ○ Pressure washing • Appropriate precautions to prevent damage or risk • Suitable techniques for the type of component and contamination Mechanical-specific cleaning techniques: • Removal of grease, oil, and particulate build-up • Use of degreasers and mechanical cleaning tools (e.g. scrapers, wire brushes) • Inspection for wear or corrosion during cleaning Post-cleaning checks: • Ensure moving parts are free from obstruction • Reapplication of lubrication where required • Verification of mechanical integrity (e.g. seals, fasteners)
Electrical and mechanical engineering maintenance technician. **S54** Conduct functional testing.	• System re-energisation: ○ Follow approved procedures to re-energise equipment safely ○ Monitor system during start-up for any irregularities ○ Functional testing: ○ Perform functional tests to confirm that equipment and systems operate as expected ○ Use appropriate test equipment and methods based on system type and task requirements

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance

	• Verification and documentation:
	  ○ Confirm operational status and system stability
	  ○ Monitor system performance to ensure correct operation
	  ○ Complete maintenance records accurately
	  ○ Notify relevant personnel that equipment is operational
	• Handover:
	  ○ Follow handover procedures to ensure clear communication of task completion
	  ○ Provide relevant information to stakeholders or operational teams

Electrical and mechanical engineering maintenance technician.
 	
S55 Check condition and operation of mechanical aspects of plant and equipment. For example, pumps.
	• Inspection and assessment of equipment such as:
	  ○ Rotating machinery; Belts; Bearings; Gears; Valves; Pumps; Hydraulic systems; Seals and gaskets; Alignment and adjustment mechanisms; Control systems; Heating and cooling systems
	• Inspection techniques:
	  ○ Perform visual inspections for wear, corrosion, leaks, and damage
	  ○ Use measurement tools (e.g. dial gauges, feeler gauges, thermometers) to assess mechanical condition
	  ○ Check alignment, tension, and lubrication levels
	  ○ Listen for abnormal noises or vibrations during operation
	• Operational checks:
	  ○ Confirm correct movement, flow, pressure, and temperature where applicable

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Verify performance against expected parameters and manufacturer specifications ○ Identify signs of mechanical inefficiency or failure • Documentation and communication: ○ Record inspection findings and report any faults ○ Communicate equipment status to relevant personnel ○ Follow company procedures for escalation and maintenance planning
Electrical and mechanical engineering maintenance technician. **S56** Remove and replace mechanical parts.	• Gears; Pumps; Belts; Pulleys; Springs; Seals and gaskets; Bearings; Shafts and couplings; Frames; Brackets; Enclosures; Reservoirs; Filters; Motors • Preparation and isolation: ○ Identify and isolate all relevant energy sources (electrical, hydraulic, pneumatic, etc.) ○ Apply lockout/tagout procedures where applicable ○ Confirm zero energy state before starting removal • Removal procedures: ○ Use appropriate tools and techniques to safely remove mechanical components ○ Follow manufacturer instructions and company procedures ○ Prevent damage to surrounding systems or components • Replacement and installation: ○ Select correct replacement parts based on specifications and compatibility

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
	○ Ensure proper alignment, fit, and secure fastening ○ Apply lubrication or sealing materials as required ○ Conduct post-installation checks for movement, clearance, and integrity
Electrical and mechanical engineering maintenance technician. **S57** Examine mechanical parts for defects. For example, pump seals.	• Inspection for defects such as: ○ Visible damage; Wear; Leaks; Corrosion; Maladjustment; Discolouration; Cracks; Fraying; Incorrect tension; Misalignment • Inspection techniques: ○ Perform visual and tactile checks using appropriate lighting and access tools ○ Use measurement instruments (e.g. feeler gauges, dial indicators, calipers) to assess tolerances and fit ○ Check for signs of vibration, overheating, or contamination ○ Compare findings against manufacturer specifications and maintenance records • Component types may include: ○ Pump seals; Bearings; Shafts and couplings; Gears and belts; Valves and actuators; Mechanical fasteners and housings
Electrical and mechanical engineering maintenance technician.	• Adjustment of parameters such as: ○ Position; Alignment; Clearances; Tension; Meshing; Speed; Torque; Pressure • Using tools and equipment such as:

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
S58 Set up, align and adjust mechanical aspects of plant.	○ Hand tools; Gauges; Cranes and hoists; Alignment tools; Feeler gauges; Micrometres; Tension gauges • Setup and alignment procedures: ○ Align shafts, couplings, pulleys, and belt systems to manufacturer tolerances ○ Adjust mechanical components to ensure smooth operation and minimal wear ○ Use precision instruments to verify alignment and clearances ○ Ensure alignment supports correct interaction with electrical systems (e.g. motor-driven assemblies) • Safety and compliance: ○ Follow lockout/tagout procedures before adjustment ○ Comply with health and safety regulations and company procedures ○ Ensure lifting and handling equipment is used safely and appropriately • Post-adjustment checks: ○ Verify mechanical integrity and secure fastening ○ Conduct functional tests to confirm correct operation ○ Record adjustments and communicate completion to relevant personnel
Electrical and mechanical engineering maintenance technician.	• Application of lubricants such as: Oils; Greases; Solid lubricants (e.g. graphite, PTFE); Dry lubricants (e.g. used in food industry environments) • Lubrication procedures:

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Observation with questions Theme and Specialist option KSBs: Conducting planned electrical and mechanical maintenance	Amplification and Guidance
S59 Lubricate mechanical assemblies.	○ Identify lubrication points and access methods ○ Select appropriate lubricant type based on component, environment, and manufacturer guidance ○ Apply lubricant using suitable tools (e.g. grease guns, brushes, dispensers) ○ Avoid over-lubrication or contamination of surrounding components • Components that may require lubrication: ○ Bearings; Shafts and couplings; Gears; Chains and belts; Valves and actuators; Motors and drive systems • Safety and compliance: ○ Follow lockout/tagout procedures before lubricating moving parts ○ Use appropriate PPE and handle lubricants safely ○ Dispose of waste materials in line with environmental and company procedures • Post-lubrication checks: ○ Confirm correct application and distribution ○ Check for leaks or excess lubricant ○ Record lubrication activity and communicate completion to relevant personnel

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Observation with questions roles and responsibilities

Role	Responsibility
Independent Assessor	Explain, to the apprentice, the format and timescales of the observation with questions before it starts. Conduct and assess the observation with questions. Use language in the delivery of the EPA that is appropriate to level 3. Invigilate and supervise the apprentice during the observation with questions, including moving between tasks and breaks, to prevent malpractice in line with the EEA invigilation procedures. Record and report assessment outcome decisions for each apprentice, following instructions and using assessment recording documentation provided by EEA.
Employer/Training Provider	The training provider must liaise effectively with the employer to ensure the apprentice is prepared for the observation with questions. Provide the venue for the observation with questions which must be suitably equipped to allow the apprentice to attempt all aspects of the observation. Provide all necessary tools and equipment for the apprentice. Ensure the apprentice has access to the resources used on a daily basis. Provide EEA with access to any employer-specific documentation as required for example, company policies Use the EEA observation with questions review service to review, discuss and approve the fitness for purpose of the assessment task. Ensure that any required supervision during the EPA period, as stated in this Specification, is in place. Employer/training provider must remain independent from the delivery of the EPA.
EEA	EEA will review the arrangements for the observation with questions planned by the employer/training provider

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Role	Responsibility
	Arrange for the observation with questions to take place, in consultation with the employer/training provider and independent assessor

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Component 2: Interview based on an EPA portfolio

Overview

The interview is based on the apprentice's EPA portfolio and focuses on holistic evidence covering the KSBs relating to the interview. The apprentices may refer to their EPA portfolio to help answer interview questions.

The EPA portfolio is **not assessed**. The EPA Portfolio Template is designed to assist the apprentice during their interview. The apprentice should use the EPA Portfolio Template to collate evidence in preparation for their interview. It should only contain evidence compiled throughout the apprenticeship. The EPA Portfolio Template will be issued to employers/training providers by their EEA Service Delivery Coordinator and must be completed and submitted to EEA at Gateway.

The apprentice will be given at least **2 weeks notice** of the interview.

The following table outlines the procedure for conducting an interview based on an EPA portfolio:

Assessors	1 independent assessor approved by EEA will conduct the interview.
Interview structure based on an EPA portfolio	The apprentice's Manager/Mentor must support the completion of the EPA Portfolio Template tasks in accordance with company policy and procedures. **Types and number of questions:** • The independent assessor must ask a minimum of 10 questions • Standardised open questions which will be based on the contents of the evidence in the EPA portfolio to ensure the apprentice's level of knowledge, skills and behaviours • Additional follow up questions are allowed, to seek clarification **Location:** Employer's premises or a suitable venue for example a training provider's premises. **Time:** • The interview must last 90 minutes (1 hour 30 minutes) • The independent assessor has the discretion to increase the time of the interview by up to 9 minutes (10%) to allow the apprentice to complete their last answer **The interview will be:** • conducted by 1 independent assessor

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	• face to face or remote, as agreed • recorded in writing using the interview record template provided by EEA • video recorded using relevant technology such as Microsoft Teams or an audio recording device • conducted under examination conditions The apprentice must have access to their EPA portfolio throughout the interview. Although questioning will cover ALL the elements of the EMT - single discipline standard (listed below in this section of the Specification), the independent assessor will prioritise areas according to what they see in the EPA portfolio. **For further guidance on the EPA portfolio refer to Section 5 Practical Guidance on an EPA Portfolio.** **Ending the interview early:** The apprentice may choose to end the interview early. The apprentice must be confident they have demonstrated competence against the assessment requirements. The independent assessor will ensure the apprentice is fully aware of all the assessment requirements and the apprentice understands the implications of ending an assessment early if they choose to do so. The independent assessor may suggest the assessment continues. The independent assessor or EEA cannot suggest or choose to end any assessment method early (unless in an emergency).
What topics will be covered?	**For further details refer to 'Knowledge, Skills and Behaviours (KSBs) Coverage below pages [85 - 117].**
When will the EPA portfolio be referred to?	The EPA portfolio: • will be reviewed by the independent assessor before the interview • can be referred to by the apprentice to illustrate their answers **Note**: the EPA portfolio is **not** directly assessed.
Grading	Fail, Pass or Distinction

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Interview based on an EPA portfolio knowledge, skills and behaviours (KSBs) coverage

The interview based on an EPA portfolio covers the following (Task references relate to Tasks specified in the EPA Portfolio Template):

Interview based on an EPA Portfolio. Theme and Core KSBs: Impact of sector on maintenance activities	Amplification and guidance

K1 Sectors in which engineering maintenance takes place. Impact of sector on maintenance activities.	Manufacturing and Production
	• Impact:
	  ○ High focus on minimising downtime to maintain production targets
	  ○ Planned Preventive Maintenance (PPM) is key to avoid equipment failure
	  ○ Use of automated systems requires both mechanical and electrical maintenance skills
	  ○ Maintenance often done in tight time windows (e.g. between production shifts)
	Process Industries
	• Impact:
	  ○ Equipment often runs continuously, requiring detailed planning for shutdowns
	  ○ Maintenance involves specialised systems (e.g. pumps, heat exchangers, control valves).
	  ○ Strict health, safety, and environmental procedures (e.g. hazardous area zoning).
	  ○ Technicians may be involved in turnaround projects (planned major overhauls)

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Interview based on an EPA Portfolio. Theme and Core KSBs: Impact of sector on maintenance activities	Amplification and guidance

	Power and Utilities
	• Impact:
	  ○ Maintenance is often safety-critical due to high voltages, pressures or hazardous materials
	  ○ Strong emphasis on compliance with regulatory bodies (e.g. Ofgem, HSE).
	  ○ Use of predictive maintenance tools (e.g. thermal imaging, vibration analysis).
	  ○ Technicians may work on-call or in remote areas to ensure uptime
	Healthcare and Medical
	• Impact:
	  ○ Maintenance ensures the functionality of critical systems (e.g. HVAC, backup power, medical gases)
	  ○ Work must often be done discreetly and hygienically, often outside patient hours
	  ○ Quick response times needed due to the importance of life-saving equipment
	  ○ Strong focus on compliance and documentation (e.g. NHS Trust protocols)
	Transportation and Infrastructure
	• Impact:

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Interview based on an EPA Portfolio. Theme and Core KSBs: Impact of sector on maintenance activities	Amplification and guidance
	○ Maintenance supports the safety and availability of transport assets (e.g. trains, lifts, escalators) ○ Often performed out-of-hours or during shutdowns to minimise disruption ○ Involves work on mobile assets and in outdoor or trackside environments ○ Technicians may need special access training (e.g. working on railways or at height) Defence and Security • Impact: ○ High importance on confidentiality, reliability and resilience of systems ○ Maintenance may include specialist or bespoke equipment (e.g. radar, secure power systems) ○ Stringent security clearance and compliance with MOD standards ○ Work may be in controlled or remote environments, requiring extra planning Facilities Management • Impact: ○ Covers a wide range of building systems: lighting, air conditioning, lifts, plumbing, etc. ○ Often reactive and varied, depending on the building use (e.g. offices, schools, etc.) ○ Requires good customer service skills and flexibility in tasks

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Interview based on an EPA Portfolio. Theme and Core KSBs: Impact of sector on maintenance activities	Amplification and guidance
	○ Maintenance may include Building Management Systems (BMS) and emergency systems. Construction and Building Services • Impact: ○ Maintenance of site equipment like cranes, hoists, and temporary electrics ○ Often involves routine inspections and safety checks. ○ Work carried out in active construction zones, requiring strong safety awareness. ○ Technicians may also install or maintain fixed systems in new builds

Interview based on an EPA Portfolio. Theme and Core KSBs: Roles and responsibilities	Amplification and guidance
K2 Maintenance disciplines and functional areas and how they work together.	• Preventative Maintenance practices such as: ○ Routine servicing and inspections ○ Replacement of parts (e.g. filters, seals) ○ Top up of lubricants and grease ○ Extending equipment life and reducing failure rates • Reactive Maintenance practices such as: ○ Repairing systems after breakdown

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Interview based on an EPA Portfolio. Theme and Core KSBs: Roles and responsibilities	Amplification and guidance
	○ Replacing failed components (e.g. belts, switches, sensors, bearings, cable connections, terminals, joints) ○ Restoring systems to operational condition • Predictive Maintenance practices such as: • Use of condition monitoring techniques: ○ Infrared thermography ○ Vibration monitoring ○ Temperature, pressure and flow monitoring ○ Acoustics and ultrasound equipment ○ Detect potential failures before they occur • Reliability-centered maintenance (RCM): ○ Improving system reliability ○ Reducing unnecessary maintenance activity and costs ○ Prioritising operational critical equipment ○ Enhancing safety and compliance ○ Using maintenance strategies to define strategies • Total Productive Maintenance (TPM) such as: ○ Applying LEAN maintenance strategies ○ Streamlining maintenance workflows ○ Using condition-based maintenance ○ Conducting Root Cause Analysis (RCA) ○ Improved workforce training ○ Integrating operational and maintenance teams

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Interview based on an EPA Portfolio. Theme and Core KSBs: Roles and responsibilities	Amplification and guidance

	• Be aware of functional integration and collaboration, including:
	  ○ Maintenance teams
	  ○ Operations
	  ○ Reliability engineering
	  ○ Spares and parts provision

K3 Individual maintenance technician's roles and responsibilities. Escalation procedures.	• Ensuring plant and equipment remain in an optimal operational condition • Minimise downtime and improving efficiency Typical roles and responsibilities may include: • Performing scheduled servicing and inspections • Carrying out lubrication, cleaning and minor adjustments of plant and equipment • Using specialist tools and equipment to conduct maintenance activities, including condition monitoring tools • Working in a safe and competent manner • Following any Safe Systems of Work (SSoW), Standard Operating Procedures (SOPs), Permits to Work as required by the workplace and industry • Report and recording findings from their maintenance activities • Knowing when and how to escalate issues outside their scope of responsibility and who to report to

K16 Emergency incident and response procedures.	• Familiarity with and ability to execute emergency procedures, including:
	  ○ Fire safety protocols
	  ○ First aid response

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Interview based on an EPA Portfolio. Theme and Core KSBs: Roles and responsibilities	Amplification and guidance

	• Awareness of the location and use of emergency resources, including:
	  ○ Emergency exits
	  ○ First aid kits
	  ○ Eye wash stations
	  ○ Fire extinguishers

S4 Respond and adapt to work demands. For example, adapt working methods to reflect changes in working environment, re-prioritise workloads to react to breakdowns and fault scenarios.	• Adapting working methods due to changes in:
	  ○ Weather conditions
	  ○ Working environments (e.g. working at height, in a confined spaces)
	• Taking responsibility for assessing and accepting or rejecting work in high risk environments
	  ○ Understanding protocols for challenging allocated tasks deemed too high risk
	• Re-prioritising workloads in response to:
	  ○ Operational constraints
	  ○ Changing requirements
	  ○ Equipment breakdowns or fault scenarios

S10 Follow emergency incident and response procedures.	• Executing emergency procedures, including:
	  ○ Fire safety protocols
	  ○ First aid response
	• Awareness of emergency resources and locations, including:
	  ○ Nearest emergency exits
	  ○ Muster points
	  ○ First aid kits

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Interview based on an EPA Portfolio. Theme and Core KSBs: Roles and responsibilities	Amplification and guidance
	○ Eye wash stations ○ Fire extinguishers
S20 Escalate issues outside limits of responsibility.	• Escalating concerns such as: • Health and safety issues • Safeguarding concerns • Maintenance problems beyond their remit • Welfare concerns affecting themselves or others

Interview based on an EPA Portfolio. Theme and Core KSBs: Work sustainably	Amplification and guidance
K14 The UK's net zero commitment. Principles of sustainability.	• The UK Government's pledge to reduce greenhouse gas (GHG) emissions to net zero by 2050 • Key policies and strategies supporting this commitment, such as: ○ Phasing out coal-fired power generation by 2024 ○ Expanding the use of renewable energy sources ○ Banning the sale of new petrol and diesel cars by 2035 ○ Investing in public transport infrastructure ○ Supporting carbon capture and storage technologies ○ Replacing traditional heating systems with low-carbon alternatives

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Interview based on an EPA Portfolio. Theme and Core KSBs: Work sustainably	Amplification and guidance

S11 Apply sustainability principles. For example, minimising waste.	• Environmental Awareness:
	  ○ Clearly articulate their understanding of environmental legislation and regulations relevant to their maintenance activities
	  ○ Discuss strategies for identifying and mitigating environmental risks associated with maintenance activities
	• Sustainable Practices:
	  ○ Explain how they implement energy-efficient practices and use sustainable materials in their work
	  ○ Describe how they promote and apply the principles of reduce, reuse and recycle in all work activities
	• Waste Management:
	  ○ Explain their approach to managing and disposing of waste materials in accordance with environmental regulations
	  ○ Describe how they segregate waste, extract materials safely for recycling and ensure hazardous substances are handled appropriately

B2 Consider sustainability when using resources and carrying out tasks.	• Efficient Resource Use:
	  ○ Provide examples of how they optimise the use of resources, such as replaceable items, water and energy, to minimise waste
	  ○ Discuss the selection and use of tools and equipment that have a lower environmental impact

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Interview based on an EPA Portfolio. Theme and Core KSBs: Participating in continuous improvement	Amplification and guidance
K26 Continuous improvement (CI) systems and techniques.	• Kaizen - continuous incremental improvement through small, ongoing positive changes • 5S - Sort, Set, Shine, Standardise and Sustain, used to organise and maintain efficient workspaces • Six Sigma – data driven methodology for reducing defects and improving quality • LEAN – principles focused on maximising value and minimising waste in processes • Other CI techniques relevant to their organisation or sector
S25 Apply continuous improvement techniques to identify improvement suggestions.	• How they have applied any relevant CI techniques to support their company's CI system • An example of a suggestion for improvement they have made, even if the company does not have a formal CI system in place • How they have used development opportunities within the company to implement a recognised CI system aimed at optimising processes and procedures • Use development opportunities at the company to implement a recognised system for CI aimed at optimising processes and procedures
S26 Carry out and record planned and unplanned learning and development activities.	• Maintaining a CPD log or record of learning • Participation in additional trade or technical courses • Engagement with industry-related articles or publications

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Interview based on an EPA Portfolio. Theme and Core KSBs: Participating in continuous improvement	Amplification and guidance
	• Completion of additional academic, technical, or professional qualifications • Involvement in off-the-job training activities • Learning gained through on-the-job training experiences
B5 Committed to continued professional development to maintain and enhance competence.	• How they demonstrate a proactive attitude toward learning and development • Their commitment to staying updated with the latest technological advancements in engineering and maintenance processes, procedures, techniques, and strategies • How they engage in continuous learning and professional development to enhance their knowledge and understanding of the sector • How they identify areas for development and take ownership of their learning to improve their performance and contribution to the organisation

Interview based on an EPA Portfolio. Theme and Core KSBs: Teamworking	Amplification and guidance (where required)
K27 Team working principles.	• Team building; being a team player; goal setting; good communication; roles and responsibilities; accountability; trust and respect; collaboration; flexibility; effective leadership; motivation; morale
K28 Principles of equity, diversity, and inclusion in the workplace.	• Respect and dignity • Equal opportunities • Fair treatment and non-discrimination • Accessibility and reasonable adjustments

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Interview based on an EPA Portfolio. Theme and Core KSBs: Teamworking	Amplification and guidance (where required)
S18 Apply team working principles.	• Effective communication; collaboration and cooperation; conflict resolution; trust and reliability; diversity and inclusion; adaptability and flexibility; leadership and initiative
B4 Team-focus to meet work goals and support inclusivity. For example, support others, show respect to others, and create and maintain productive working relationships.	• Supporting others, such as: Encouraging collaboration; Providing constructive feedback; Celebrating achievements • Showing respect to others, such as: Modelling respectful behaviour; Promoting active listening; Addressing conflicts promptly • Creating and maintaining productive working relationships, such as: Setting clear goals; Encouraging open communication; Fostering inclusivity

Interview based on an EPA Portfolio. Theme and Core KSBs: Produce written documents	Amplification and guidance (where required)
K30 Written communication techniques.	• Red pen activities (e.g. amending job details, technical information); use of email to record communication; updating electronic systems used within their sector or industry,(e.g. desktop, laptop, tablet for onsite or field work); written test; group chat or messaging platforms
S22 Produce or update documents. For example, handover notes and reports.	• Handover notes; reports; general tips or written guidance shared with colleagues

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Interview based on an EPA Portfolio. Theme and Core KSBs: Digital and information technology	Amplification and guidance (where required)
K31 Digital and information technology to support engineering maintenance. General data protection regulation (GDPR). Cyber security.	• Data protection – the importance of safeguarding personal and commercially sensitive data, and ensuring it is not released to unauthorised persons • GDPR awareness – understanding the General Data Protection Regulation (GDPR) requirements relevant to their role, including key principles such as lawfulness, fairness, transparency, purpose limitation, data minimisation, accuracy, storage limitation, integrity, confidentiality, and accountability • Cybersecurity – awareness of cybersecurity risks and protective measures, including Encryption, firewalls, and access controls; Regular system updates and patching; Strong passwords and multi-factor authentication; Common cyber threats such as malware, phishing, ransomware, denial of service (DoS), and social engineering attacks • Network, information, and application security – understanding the role of secure systems and practices in maintaining operational integrity
S24 Use digital and information technology. For example, databases, data sharing platforms, email, management information systems, and word processing. Follow cyber security and GDPR requirements.	• Use of digital tools such as databases, data sharing platforms, email, management information systems, and word processing software • How they have followed cyber security protocols and complied with GDPR requirements when handling data or using digital systems

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
K43 Common electrical plant, equipment, and systems failure modes.	• Electrical plant and equipment, such as; Single-phase and three-phase electrical systems; Electrical outlets and switches; Switchgear and contactors; Isolators; Electrical control panels and distribution boards; Bus bars; Transformers; AC and DC motors and generators; Control systems (e.g. PLCs and SCADA); Boilers and heaters; Residual Current Devices (RCDs), circuit breakers, and Surge Protection Devices (SPDs); Cables and wiring types: single core, multi-core, twin and earth, steel wire armoured, shielded; Cable characteristics: voltage rating, insulation class (I and II), current carrying capacity, cable sizing (CSA metric and SWG imperial) • Common failure modes, such as: Earth loop impedance failures; Wiring and connection faults: open circuit, short circuit, earth faults, loose or corroded connections, cable damage; Insulation failures; Phase unbalance; Overload conditions; Electrical component failures: circuit breakers, fuses, motors, generators, capacitors, batteries, and electronic circuit components; Power supply issues: blackout, brownout, overvoltage, undervoltage
K44: Electrical fault-finding and rectification techniques; diagnostic equipment.	• Fault-finding methods, such as: ○ 6-point method ○ Half split method ○ Unit substitution ○ Input/Output ○ Functional testing

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Use of manuals and circuit diagrams ○ Sensory checks (visual checks, smell, noise, feel) ○ Movement checks ○ Measurement techniques • Electrical test equipment, including: ○ Multimeters/multifunction testers ○ Oscilloscopes ○ Ammeters and voltmeters ○ Megohmmeters/insulation resistance testers ○ Clamp meters ○ Earth resistance testers ○ Circuit breaker testers ○ Battery Chargers ○ Leakage current testers ○ Continuity testers ○ Dielectric strength testers ○ Voltage testers and indicators ○ Proving units • Safety categories for electrical test equipment, such as CAT I, II, III, IV • Portable Appliance Testing (PAT) and Class I / Class II insulation systems • Diagnostic equipment, such as:

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Thermal imaging camera (thermography) ○ Heat guns ○ Vibration analysers ○ Acoustics equipment
K45 Problem solving and critical reasoning techniques.	• Structured problem-solving techniques, such as ○ Mind mapping (individual and group) ○ Logical thinking (cause and effect) ○ Fault-finding approaches ○ Fishbone diagram (Ishikawa diagram) ○ Pattern recognition in system behaviour ○ Root Cause Analysis (RCA) ○ Elimination techniques • Continuous improvement frameworks, including: ○ PDCA Cycle: Plan, Do, Check, Act ○ DMAIC Process – Define, Measure, Analyse, Improve, Control Critical Reasoning Skills • Evaluating evidence and data to support conclusions • Identifying assumptions and potential biases • Drawing logical inferences from system behaviour • Prioritising actions based on risk and impact • Reflecting on outcomes to improve future decision-making

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance

K55 Common control and instrumentation equipment and control system failure modes.	Common Control and Instrumentation Equipment
	• Sensors and Transducers:
	  ○ Temperature sensors
	  ○ Pressure sensors
	  ○ Flow meters
	  ○ Level sensors
	  ○ Position and motion sensors
	• Controllers and Process Control Systems:
	  ○ Programmable Logic Controllers (PLCs)
	  ○ Distributed Control Systems (DCS)
	  ○ Supervisory Control and Data Acquisition (SCADA)
	  ○ Human-Machine Interfaces (HMI)
	• Actuators and Final Control Elements:
	  ○ Valves and actuators
	  ○ Motors and drives
	  ○ Relays and contactors
	• Communication and Networking Equipment:
	  ○ Industrial communication protocols (e.g. Modbus, Profibus, Ethernet/IP)
	  ○ Wireless sensors and Internet of Things (IoT) devices
	Typical Failure Modes
	• Sensor and Transducer failure modes:
	  ○ Signal drift
	  ○ Open Circuit
	  ○ Short Circuit

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Environmental degradation (e.g. heat, moisture, vibration) • Signal Transmission Failure Modes: ○ Signal loss or attenuation ○ Electrical noise interference ○ Latency or timing issues • Controller Failure Modes: ○ Central processing unit (CPU) lockup or system crashes ○ Incorrect logic execution ○ Communication faults ○ Power supply interruptions • Actuator and Final Control Element Failure Modes: ○ Mechanical sticking or jamming ○ Overheating ○ Delayed or sluggish response ○ Incomplete or failed actuation (e.g. valve fails to open/close) • Power Supply and Electrical Failure Modes: ○ Power surge or voltage spikes ○ Voltage drops or brownouts ○ Backup battery depletion or failure • Calibration and Drift Failure Modes: ○ Loss of measurement sensitivity ○ Offset errors ○ Span errors • Environmental and Mechanical Failure Modes:

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Exposure to temperature extremes ○ Vibration and mechanical shock • Corrosion, moisture ingress and contamination
K56 Control and instrumentation maintenance fault-finding and rectification techniques; diagnostic equipment.	Maintenance Techniques - This may involve: • Routine Maintenance - This may involve: ○ Calibration ○ Cleaning ○ Inspection for physical damage ○ Lubrication • Predictive Maintenance – This may involve: ○ Vibration monitoring of pumps and motors ○ Pressure and temperature monitoring to detect leaks or blockages ○ Signal trending to identify performance degradation • Preventative Maintenance - This may involve: ○ Vibration monitoring of pumps and motors ○ Pressure and temperature monitoring to detect leaks or blockages ○ Signal trending to identify performance degradation Fault-Finding and Diagnostic Techniques - This may involve: • Symptom Identification • Data gathering • Use of test equipment:

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Multimeters ○ Oscilloscopes ○ Loop testers • Highway addressable remote transducer (HART) communicators • Isolation • Visual inspection • Signal testing • Power supply checks • Connections checks • Software and configuration checks Rectification techniques such as: • Recalibration • System reset • Devise reset • Component replacement • Lubrication and tightening • Wire repair or replacement • Power supply replacement • Sensor replacement • System update or reinstall • Reprogramming

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	• Check communication protocols

S29 Use electrical diagnostic equipment and apply fault-finding and rectification techniques. Use control and instrumentation diagnostic equipment and apply fault-finding and rectification techniques.	• How they applied fault-finding methods and diagnostic techniques in real maintenance scenarios
	• Use of appropriate diagnostic equipment (as outlined in K44) to identify faults
	• How they interpreted test results or observations to determine the root cause of the issue
	• The steps they took to safely and effectively rectify the fault and restore system functionality
	Fault-Finding and Diagnostic Techniques - This may involve:
	• Half-split method for isolating faults
	• Equipment substitution or replacement
	• Symptom identification
	• Data gathering and analysis
	• Use of test equipment such as:
	  ○ Multimeters
	  ○ Oscilloscopes
	  ○ Loop testers
	  ○ Highway Addressable Remote Transducer (HART) communicators
	• Isolation techniques
	• Visual inspection

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	• Signal testing • Power supply checks • Connection checks • Software and configuration checks Rectification Techniques • Recalibration of sensors or instruments • System reset procedures • Device reset procedures • Component replacement • Lubrication and tightening of mechanical parts • Wire repair or replacement • Power supply replacement • Sensor replacement • System update or reinstall • Reprogramming of control systems • Verification and adjustment of communication protocols
S30 Apply problem solving and critical reasoning techniques.	• How they applied specific techniques (as outlined in K45) such as Root Cause Analysis (RCA), the PDCA cycle, or logical elimination to resolve a fault or issue

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance

	• How they used structured approaches like brainstorming, fishbone diagrams, or the DMAIC process to analyse and break down complex problems
	• How they evaluated different options and made decisions based on evidence, reasoning, and system behaviour
	• A real example where their use of critical reasoning led to a successful resolution of an electrical fault or improvement in system performance
	Application of Problem Solving Techniques
	• Fault-finding to isolate and resolve system issues
	• Logical thinking to identify cause and effect relationships
	• Pattern recognition in system behaviour and data trends
	• Root Cause Analysis (RCA) to determine underlying faults
	• Elimination methods to narrow down potential causes
	Use of Structured Problem Solving Models
	• PDCA Cycle:
	  ○ Plan — define the problem and develop a strategy
	  ○ Do — implement the solution
	  ○ Check — evaluate the outcome
	  ○ Act — standardise successful solutions or adjust as needed
	• DMAIC Process:
	  ○ Define — clearly state the problem

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Interview based on an EPA Portfolio. Specialist option: Electrical and control instrumentation engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Measure — collect relevant data ○ Analyse — identify root causes ○ Improve — implement corrective actions ○ Control — sustain improvements and monitor performance Demonstration of Critical Reasoning • Evaluating evidence and system data to support decisions • Prioritising actions based on risk, impact, and urgency • Reflecting on outcomes to improve future fault-finding approaches Communicating reasoning and decisions effectively to others

Interview based on an EPA Portfolio Specialist option: Electrical and control and instrumentation engineering maintenance technician Theme: Cable installation and termination	Amplification and guidance
K40 Cable termination methods.	• Terminal block screws; soldering; crimping; ring/spade terminals under screw connection; in-line push-in connectors; cable glands; compression terminations; wire trap terminations; Insulation Displacement Connections (IDC)

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Interview based on an EPA Portfolio Specialist option: Electrical and control and instrumentation engineering maintenance technician Theme: Cable installation and termination	Amplification and guidance
S33 Prepare and terminate electrical cables.	• Cable routing and bending techniques • Cable identification and colour coding • Stripping back insulation to appropriate lengths • Applying cable protection (e.g. sleeving, conduit, trunking) • Termination methods appropriate to the cable and application • Use of cable supports and strain relief to ensure mechanical integrity • Ensuring terminations meet safety, quality, and regulatory standards

Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
K67 Common electrical plant, equipment, and systems failure modes.	• Electrical plant and equipment, such as; Single-phase and three-phase electrical systems; Electrical outlets and switches; Switchgear and contactors; Isolators; Electrical control panels and distribution boards; Bus bars; Transformers; AC and DC motors and generators; Control systems (e.g. PLCs and SCADA); Boilers and heaters; Residual Current Devices (RCDs), circuit breakers, and Surge Protection Devices (SPDs); Cables and wiring types: single core, multi-core, twin and earth, steel wire armoured, shielded; Cable

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	characteristics: voltage rating, insulation class (I and II), current carrying capacity, cable sizing (CSA metric and SWG imperial) • Common failure modes, such as: Earth loop impedance failures; Wiring and connection faults: open circuit, short circuit, earth faults, loose or corroded connections, cable damage; Insulation failures; Phase unbalance; Overload conditions; Electrical component failures: circuit breakers, fuses, motors, generators, capacitors, batteries, and electronic circuit components; Power supply issues: blackout, brownout, overvoltage, undervoltage
K68 Electrical fault-finding and rectification techniques; diagnostic equipment.	• Fault-finding methods, such as: ○ 6-point method ○ Half split method ○ Unit substitution ○ Input/Output ○ Functional testing ○ Use of manuals and circuit diagrams ○ Sensory checks (visual checks, smell, noise, feel) ○ Movement checks ○ Measurement techniques • Electrical test equipment, including: ○ Multimeters/multifunction testers ○ Oscilloscopes ○ Ammeters and voltmeters

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	○ Megohmmeters/insulation resistance testers ○ Clamp meters ○ Earth resistance testers ○ Circuit breaker testers ○ Battery Chargers ○ Leakage current testers ○ Continuity testers ○ Dielectric strength testers ○ Voltage testers and indicators ○ Proving units • Safety categories for electrical test equipment, such as CAT I, II, III, IV • Portable Appliance Testing (PAT) and Class I / Class II insulation systems • Diagnostic equipment, such as: ○ Thermal imaging camera (thermography) ○ Heat guns ○ Vibration analysers • Acoustics equipment
K69 Problem solving and critical reasoning techniques	• Root Cause Analysis (RCA) • 5 Whys technique • Fault Tree Analysis (FTA) • Fishbone diagram (Ishikawa) • Failure Mode and Effect Analysis (FMEA)

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	• Mind mapping and group problem solving • Simulation and modelling to test hypotheses and validate solutions
K76 Common maintenance problems relating to mechanical aspects of plant and equipment.	Common Mechanical Maintenance Problems • Belt problems: Breaking; Slipping; Cracking • Bearing problems: Wear; Lubrication issues; Overloading; Overheating • Pump Failures: Cavitation; Leaking; Blockages; Over heating • Gearbox failures: Damage to gear teeth; Overheating; Lubrication; Leaks; Misalignment • Motor failures: Excessive vibration or noise; Overheating; Electrical faults; Lubrication issues • Valve Issues: Sticking or jamming; Maladjustment; Leaking; Corrosion • Drive Shaft issues: Misalignment; Bearing wear or failure; Shaft wear • Heat Exchanger Issues: Blockages; Leaks; Corrosion • Structural failures: Cracks; Corrosion; Welding defects • Hydraulic system failures: Leaks; Pump failure; Fluid contamination
K77 Mechanical maintenance fault-finding and rectification techniques; diagnostic equipment.	• Sensory checks:; Visual inspection; Detection of unusual smells; Listening for uncharacteristic noises; Touch-based checks (e.g. vibration, heat, wear) • Measurement and Monitoring Tools:; Pressure and flow gauges/meters; Laser alignment tools; Load testing equipment; Vibration analysis tools; Infrared thermography devices; Ultrasonic testing equipment; Oil health monitoring systems

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	• Non-Destructive Testing (NDT): Penetrating dyes; Other NDT methods appropriate to mechanical systems Rectification techniques such as: • Component replacement • Regular servicing and maintenance • Realignment of mechanical components • Structural repairs, including Welding; Use of mechanical fasteners; Reinforcement techniques • Pump and valve maintenance • Gearbox repairs • Cleaning of mechanical systems • Balancing of rotating equipment • Mechanical adjustments to restore functionality
S47 Use electrical and mechanical diagnostic equipment and apply fault-finding and rectification techniques.	The apprentice should refer to the diagnostic techniques and equipment listed in K77 and provide examples of how they have particularly applied these within their role. This includes, but is not limited to: • Sensory checks (e.g. visual, auditory, tactile) • Use of diagnostic tools (e.g. vibration analysis, thermography, ultrasonic testing)

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Problem solving and fault-finding	Amplification and guidance
	• Application of rectification techniques (e.g. component replacement, realignment, structural repairs)

S48 Apply problem solving and critical reasoning techniques	The apprentice should refer to the techniques listed in **K69** and provide examples of how they have applied these in practice. This includes, but is not limited to:
	• Use of structured problem-solving techniques such as:
	  ○ Root Cause Analysis (RCA)
	  ○ 5 Whys technique
	  ○ Fault Tree Analysis (FTA)
	  ○ Fishbone diagrams (Ishikawa)
	  ○ Failure Mode and Effects Analysis (FMEA)
	• Application of collaborative and visual methods:
	  ○ Mind mapping
	  ○ Group problem solving
	  ○ Simulation and modelling to test and validate solutions
	• Demonstration of critical reasoning through:
	  ○ Logical decision-making
	  ○ Prioritisation of actions
	  ○ Evaluation of outcomes and reflection on effectiveness

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Cable installation and termination	Amplification and guidance
K64 Cable termination methods.	• Understand common termination techniques such as crimping, soldering, and gland fitting • Recognise appropriate use of terminals, connectors, and cable glands for different environments and voltages • Apply correct stripping, preparation, and securing methods to ensure reliable electrical and mechanical connections • Identify risks of poor termination (e.g. loose connections, ingress, overheating) and how to mitigate them • Follow manufacturer specifications and relevant standards (e.g. BS 7671, IEC standards)
S51 Prepare and terminate electrical cables.	• Select appropriate cable type, size, and termination method based on application and environment • Carry out cable preparation including stripping, inspecting, and dressing conductors • Use correct tools and techniques for terminating (e.g. crimping, soldering, connector fitting) • Ensure terminations are secure, electrically sound, and mechanically protected • Follow relevant safety procedures and standards (e.g. LOTO, BS 7671) • Record and verify termination work through testing and documentation

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Bench fitting techniques	Amplification and guidance
K78 Bench fitting techniques: cutting threads, mechanical fitting, and joining.	• Marking out • Sawing • Drilling • Filing • Chiselling • Thread cutting (using taps and dies) • Deburring • Scraping • Riveting • Bending and shaping • Mechanical fastening methods (e.g. bolts, screws and clamps)
S60 Apply bench fitting techniques.	Safety practices: • Wear appropriate PPE to prevent injuries • Maintaining a clean and organised workstation to support efficiency and safety • Handle cutting fluids safely to avoid skin irritation and maintain a safe environment Measuring and Marking Out: • Using measuring instruments to ensure accurate dimensions • Mark out workpieces precisely to support correct fabrication and assembly Hand Tools Usage:

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Specialist option: Electrical and mechanical engineering maintenance technician Theme: Bench fitting techniques	Amplification and guidance
	• Sawing and filing to shape and finish components • Drilling and tapping to create holes and threads with precision Practical Application • Fabricating components or assemblies by interpreting drawings and applying bench fitting techniques (e.g. marking out, sawing, filing, drilling, tapping) • Operate pillar drills including understanding drill bit geometry and sharpening methods Quality Control • Ensuring manufactured items meet specified tolerances through careful use of hand tools and inspection techniques

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Interview based on an EPA portfolio roles and responsibilities

Role	Responsibility
Independent Assessor	Record and report assessment outcome decisions for each apprentice, following instructions and using assessment recording documentation provided by EEA. Review the apprentice's EPA portfolio prior to the question and answer session. In the event of an apprentice requesting to end the interview early, the assessor must ensure the apprentice is fully aware of all the assessment requirements for the session. Requests must be documented in line with instructions provided by EEA.
Employer/Training Provider	The interview must be scheduled with EEA for a date and time which allow the apprentice to be well prepared. Ensure the apprentice has access to their EPA portfolio before and on the day of the interview.
EEA	Arrange for the interview to take place, in consultation with the employer/training provider and independent assessor.

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Component 3: Multiple-choice test

Overview

The multiple-choice test is a computer-based test which consists of 50 multiple-choice questions. Paper-based tests are available on request.

Apprentices have 75 minutes to complete the test.

The multiple-choice questions will have four possible answers of which one will be correct.

At least two scenario-based questions will be used to assess S13, requiring the apprentice to demonstrate how they apply mathematical principles and formulae in the context of engineering maintenance activities.

The Pass mark is 35 correct answers.

For this paper:

- a (scientific) calculator is allowed
- access to the internet or intranet is NOT allowed
- apprentices cannot refer to any reference books or materials

Apprentices must take the test in a quiet space, free from distractions and influence, in the presence of an invigilator.

Apprentices must be given at least **2 weeks notice** of the date and time of the multiple-choice test.

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Multiple-choice test coverage

The multiple-choice test consists of 50 core knowledge questions.

The table below lists each of the knowledge elements, assessed in the knowledge assessment. Amplification and Guidance can be found in the table above.

Number of Questions	Knowledge	Amplification and Guidance
1 - 3	**Core K6:** Equipment Life Cycle Considerations	6.1 Awareness of maintenance strategies and their impact on equipment longevity (e.g. preventive, predictive, reactive) 6.2 Understanding of environmental factors affecting equipment performance and degradation (e.g. temperature, humidity, contamination) 6.3 Awareness of training requirements for personnel to ensure correct operation, maintenance and safety throughout the equipment life cycle 6.4 Knowledge of cost considerations including acquisition, operation, maintenance and disposal costs 6.5 Understanding of equipment efficiency and how it influences operational performance and energy consumption over time 6.6 Awareness of disposal methods and end-of-life considerations, including environmental compliance and sustainability

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Number of Questions	Knowledge	Amplification and Guidance
1 - 3	**Core. K7:** Maintenance strategies: planned preventative maintenance (PPM), condition-based maintenance (CBM), scheduled maintenance, total productive maintenance (TPM), breakdown and run to failure maintenance.	7.1 Knowledge of Planned Preventative Maintenance (PPM) – regular, scheduled tasks to prevent equipment failure and extend asset life 7.2 Understanding of Scheduled Maintenance – maintenance activities performed at fixed intervals based on time or usage 7.3 Awareness of Condition-Based Maintenance (CBM) – maintenance triggered by monitoring equipment condition (e.g. vibration, temperature, wear) 7.4 Knowledge of Total Productive Maintenance (TPM) – holistic approach involving all staff to improve equipment reliability and performance 7.5 Understanding of Reactive or Breakdown Maintenance – maintenance carried out after equipment failure 7.6 Awareness of Run to Failure Maintenance – strategy where equipment is allowed to operate until failure, typically for non-critical assets 7.7 Knowledge of Corrective Maintenance – repairs made to restore equipment after identifying faults during inspections or operations 7.8 Awareness of Shutdown Maintenance – planned maintenance during plant shutdowns to address major repairs or upgrades

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Number of Questions	Knowledge	Amplification and Guidance
1 - 3	**Core K8:** Health and safety regulations – key features and impact on role: ATEX - safety requirements for workplaces and equipment used in explosive atmospheres, Control of Asbestos Regulations, Control of Major Accident Hazards (COMAH) Regulations, Control of Substances Hazardous to Health (COSHH) Regulations, Dangerous Substances and Explosive Atmospheres Regulations (DSEAR), Display Screen Equipment Regulations (DSE), Health and Safety at Work Act (HASAWA), Lifting Operations and Lifting Equipment Regulations (LOLER), Management of Health and Safety at Work, Manual Handling Operations Regulations, Personal Protective Equipment (PPE) at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Working at Height Regulations, Working in Confined Spaces Regulations,	8.1 Health and Safety at Work Act (HASAWA) – overarching duties for employers and employees to ensure safe working environments 8.2 Provision and Use of Work Equipment Regulations (PUWER) – requirements for safe selection, maintenance and use of work equipment 8.3 Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) – legal obligations for reporting workplace incidents and near misses 8.4 Lifting Operations and Lifting Equipment Regulations (LOLER) – safe planning, use and inspection of lifting equipment 8.5 Management of Health and Safety at Work Regulations – risk assessment and emergency procedures for managing workplace safety 8.6 Manual Handling Operations Regulations – guidance on safe lifting, carrying and moving of loads 8.7 Working at Height Regulations – control measures for tasks performed above ground level 8.8 Confined Spaces Regulations – safety requirements for working in enclosed or restricted spaces 8.9 Workplace (Health, Safety and Welfare) Regulations – standards for workplace conditions including lighting, ventilation and cleanliness

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Number of Questions	Knowledge	Amplification and Guidance
	Workplace (health, safety, and welfare) Regulations.	8.10 Personal Protective Equipment (PPE) at Work Regulations – provision and use of appropriate PPE to mitigate risks 8.11 Control of Substances Hazardous to Health (COSHH) Regulations – safe handling and control of harmful substances 8.12 Control of Major Accident Hazards (COMAH) Regulations – prevention and mitigation of major industrial accidents 8.13 Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) – control of fire and explosion risks from hazardous substances 8.14 Display Screen Equipment Regulations (DSE) – ergonomic and health requirements for screen-based work 8.15 Control of Asbestos Regulations – procedures for managing asbestos risks in the workplace 8.16 ATEX Regulations – safety requirements for equipment and workplaces in explosive atmospheres
2 - 3	**Core K13:** Environmental regulations and standards – impact on role: Environmental Management Systems standard, Environmental Protection Act, and Hazardous Waste Regulations.	13.1 Awareness of Environmental Management Systems (EMS) and ISO 14001:2015 – international standard for reducing environmental impact and improving sustainability 13.2 Knowledge of the Environmental Protection Act 1990 – legal duties for waste management, pollution control, and statutory nuisances

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Number of Questions	Knowledge	Amplification and Guidance
		13.3 Understanding of the Environment Act 2021 – UK framework for environmental governance, including targets for air quality, biodiversity, water and waste 13.4 Awareness of the Hazardous Waste (England and Wales) Regulations 2005 – requirements for classification, handling, movement and disposal of hazardous waste 13.5 Knowledge of the Waste Electrical and Electronic Equipment (WEEE) Regulations 2013 – obligations for safe disposal, recycling and recovery of electrical and electronic equipment
1 - 3	**Core K17:** Algebraic methods. Trigonometric methods and standard formulae to determine areas and volumes. Statistical methods to display data (mean, mode, median). Elementary calculus techniques: coefficient, gradient of a curve, rate of change.	17.1 Knowledge of algebraic methods including solving and manipulating linear equations 17.2 Understanding of trigonometric methods for calculating angles, distances and relationships in mechanical systems 17.3 Awareness of standard geometric formulae used to determine areas and volumes of common shapes and components 17.4 Knowledge of statistical methods to display and interpret data, including mean, mode and median 17.5 Understanding of elementary differential calculus techniques including differentiation 17.6 Awareness of coefficients, gradients of curves and rate of change in relation to system performance and analysis

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Number of Questions	Knowledge	Amplification and Guidance
3 - 4	**Core K18:** Properties of engineering materials and impact on use.	18.1 Knowledge of mechanical properties including strength, hardness, ductility, toughness and elasticity 18.2 Awareness of thermal properties such as thermal conductivity, thermal expansion and melting point 18.3 Understanding of electrical properties including conductivity, resistivity and dielectric strength 18.4 Knowledge of chemical properties such as corrosion resistance, reactivity and oxidation resistance 18.5 Awareness of physical properties including density, specific gravity and transparency 18.6 Understanding of environmental properties such as UV resistance and recyclability 18.7 Knowledge of manufacturing properties including machinability, weldability and malleability 18.8 Awareness of how material properties impact functionality, durability, cost, safety and sustainability in engineering applications

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Number of Questions	Knowledge	Amplification and Guidance
1 - 3	**Core K21:** Engineering representations, sketches, drawings, and graphical information conventions.	21.1 Knowledge of technical drawings used to convey detailed engineering information, including orthographic and isometric views 21.2 Awareness of schematic diagrams representing system layouts and functional relationships (e.g. electrical, pneumatic, hydraulic) 21.3 Understanding of flowcharts used to represent processes, sequences and decision points in engineering systems 21.4 Knowledge of graphs and charts used to display data trends, performance metrics and comparisons 21.5 Awareness of freehand sketches used for quick visual communication of ideas, modifications or faults 21.6 Understanding of graphical information conventions including: Standardisation systems (e.g. British Standards [BS], International Standards [ISO]), Line types and styles (e.g. hidden, centre, cutting plane), Dimensioning and tolerances, Symbols and annotation practices, Use of scales and proportion, Colour coding for system identification and safety
1 - 3	**Core K32:** Industry 4.0 - the integration of physical systems with internet connectivity and cloud computing: technologies, systems, and benefits.	32.1 Awareness of interconnectivity of physical systems and technologies including: Data-driven decision making, Automation and robotics, Artificial Intelligence (AI), Cloud computing, Additive manufacturing (3D printing), Augmented Reality (AR) and Virtual Reality (VR)

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Number of Questions	Knowledge	Amplification and Guidance
		32.2 Understanding of cybersecurity principles and the importance of protecting connected systems and data 32.3 Knowledge of cyber-physical systems – integrated networks of sensors, actuators, and control systems linked via digital platforms 32.4 Awareness of the benefits of Industry 4.0 including: Increased productivity, Cost savings, Enhanced quality, Improved sustainability, Better decision making, Greater customisation and operational flexibility
2 - 3	**Core S13:** Use mathematical principles and formulae to support engineering maintenance.	13.1 Multiple-choice questions for the assessment of S13 will be scenario based to assess the application of mathematical principles and formulae used to support engineering maintenance.
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K33**: Electricity at Work regulations. IET wiring regulations	33.1 Awareness of the Electricity at Work Regulations 1989 – legal duties for ensuring electrical systems are constructed, maintained and used to prevent danger, duties of employees and employer 33.2 Knowledge of BS 7671:2018 – Requirements for Electrical Installations (IET Wiring Regulations), including design, installation, test, and verification standards for safe electrical systems 33.3 Understanding of GS38 guidance from Health and Safety Executive (HSE) – safe selection and use of electrical test

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Number of Questions	Knowledge	Amplification and Guidance
		equipment, including probe design, insulation, and protection against electric shock and short circuits 33.4 Understanding of isolation procedures, Lock Out Tag Out (LOTO), authorised persons, PPE hierarchy of controls, testing for dead procedures, functional testing, fault finding testing, integrity testing 33.5 Knowledge of processes and procedures for safe systems of work, emergency procedures, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) and reporting incidents to Health & Safety Executive (HSE), Provisional and Use of Work Equipment Regulations (PUWER), Portable Appliance Testing (PAT), earthing and bonding of equipment and structures
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K35:** Principles of single phase and three-phase equipment, plant, and systems, the operation of motors and generators, and the use of monitoring and protection equipment.	35.1 Understanding of single-phase electrical systems – characteristics, applications, and limitations in maintenance environments 35.2 Knowledge of three-phase electrical systems – principles of operation, applications, and use in industrial plant and equipment 35.3 Knowledge of motor operation – types (e.g. AC, DC, induction), starting methods, and performance characteristics, motor construction, and principles of operation

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Number of Questions	Knowledge	Amplification and Guidance
		35.4 Understanding of generator operation – principles of energy conversion, excitation methods, and load handling, generator construction, and principles of operation 35.5 Knowledge of monitoring devices used in electrical systems, including: voltmeters and ammeters, temperature and vibration sensors, power quality analysers, clamp meters 35.6 Awareness of protection devices used to safeguard electrical systems, including: circuit breakers, mini-circuit breakers (MCBs), and fuses, overload relays, Residual Current Devices (RCDs), surge protection devices 35.7 Understanding of testing electrical motors and generators, types of tests: functional, fault, integrity, verification and test equipment and test requirements
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K36:** Electrical engineering principles: circuit terminology, Ohm's Law, transformer theory, and power calculations.	36.1 Knowledge of circuit terminology including: circuit, node, branch, loop, mesh, voltage, current, resistance, power, series and parallel configurations 36.2 Understanding of Ohm's Law and its application in calculating voltage, current and resistance in electrical circuits 36.3 Awareness of Kirchhoff's Laws – Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) – and their use in circuit analysis

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Number of Questions	Knowledge	Amplification and Guidance
		36.4 Knowledge of transformer theory including principles of electromagnetic induction, Faraday's Law, turns ratio, voltage transformation and efficiency 36.5 Understanding of electrical power calculations for both AC and DC systems, including real, reactive and apparent power, power factor, efficiency of electrical machines 36.6 Awareness of coefficients and their role in electrical equations and system analysis
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K37:** Functions and applications of electrical circuits.	37.1 Understanding of the functions of electrical circuits, including: Alternating Current and Direct Current theory (AC and DC), power distribution, energy conversion, signal processing and transmission, control of systems and devices, energy storage systems 37.2 Awareness of the applications of electrical circuits across various sectors, including: domestic and industrial environments, communications and transportation systems, power generation and distribution, medical equipment and healthcare technologies, consumer electronics, safety and security systems
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.**	38.1 Awareness of different types of electrical drawings and diagrams used in maintenance and fault diagnosis, including: circuit diagrams, wiring diagrams, block diagrams, layout

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Number of Questions	Knowledge	Amplification and Guidance
	K38: Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.	diagrams, single-line diagrams, earthing diagrams, control diagrams 38.2 Understanding of standard symbols and abbreviations used in electrical drawings and diagrams to represent components such as resistors, capacitors, switches, relays, transformers, and protective devices 38.3 Knowledge of graphical conventions including line types, connection points, and signal paths 38.4 Awareness of documentation standards (e.g. BS and IEC) governing the use of symbols and diagram formats and drawing conventions
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K39:** Different types of cables; their specifications and application.	39.1 Awareness of different cable types used in electrical systems, including: Low voltage and high voltage cables, Steel Wire Armoured (SWA) cables, coaxial and ethernet cables, fire-resistant and fire-retardant cables, instrumentation cables, twin and earth cables, control cables, multi-core and single core cables, single phase and three phase cable colours 39.2 Understanding of cable specifications, including: voltage rating, conductor type (e.g. copper, aluminium, mica), Insulation type, Armour type (e.g. steel wire armour, aluminium armour), Shielding methods (e.g. braided, foil), design requirements and selection of cables in accordance with BS 7671:2018 IET

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Number of Questions	Knowledge	Amplification and Guidance
		Wiring Regulations: current carrying capacity, voltage drop, installation, ambient temperature, environmental 39.3 Knowledge of cable applications across various environments, including: domestic residential and commercial industrial installations, power distribution systems, underground and outdoor installations, portable tools and appliances, signal transmission and communications, emergency systems and safety-critical systems and environments
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K47:** Control and instrumentation engineering principles, terminology, and calculations.	47.1 Understanding of measurement and monitoring principles used in instrumentation systems 47.2 Awareness of control system types and functions, including open-loop and closed-loop systems 47.3 Knowledge of signal transmission methods including analogue and digital signals, and communication protocols 47.4 Understanding of actuation principles including electro-mechanical, pneumatic and hydraulic actuators 47.5 Awareness of automation technologies and their role in process control and optimisation 47.6 Knowledge of safety systems including interlocks, safety switches, alarms, emergency stops and shutdown systems and fail-safe design

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Number of Questions	Knowledge	Amplification and Guidance
		47.7 Familiarity with key control and instrumentation terminology including: process variables, set point, error, controller output, hysteresis, dead time, control range and span, calibration, control loop 47.8 Understanding of instrumentation calculations including: Conversion of analogue signals to engineering units, Flow rate calculations, Proportional Integral Derivative (PID) feedback control equation components, thermocouple function converting heat directly into voltage for temperature output via the Seebeck effect.
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K48:** Control and instrumentation equipment installation and connection requirements.	48.1 Knowledge of cable selection based on application, signal type, environmental conditions, and safety requirements 48.2 Awareness of connection types used in instrumentation systems, including screw terminals, push-in connectors, plugs and sockets, crimped connections, soldered connections 48.3 Understanding of conduit systems for cable protection and routing, cable strain relief support features, including material types and installation practices 48.4 Awareness of correct location and positioning of instrumentation components such as sensors, actuators and control panels to ensure accurate measurement and system performance

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Number of Questions	Knowledge	Amplification and Guidance
		48.5 Knowledge of cable marking and labelling practices to support identification, maintenance and fault diagnosis
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K49:** Operating principles of Control and instrumentation devices: flow, level, pressure, and temperature instruments, analysers, transducers, transmitters, gauges, and pneumatics.	49.1 Understanding of key operating principles used in instrumentation devices, including: Bernoulli's Principle, Continuity Equation, Faraday's Law of Electromagnetic Induction, Coriolis Effect, Doppler Principle, Buoyancy, Capacitance, Hydrostatic Pressure, Piezoelectric Pressure, Gauge Pressure, Differential Pressure 49.2 Knowledge of control and measurement devices used in instrumentation systems, including: pressure instruments: Bourdon tubes, diaphragm sensors, manometers, temperature instruments: thermocouples, Resistance Temperature Detectors (RTDs), thermistors, bimetallic and infrared thermometers, thermostats, analytical instruments: pH analysers, gas analysers, conductivity meters, oxygen analysers, signal devices: transducers, transmitters, analogue and digital gauges, pneumatic devices: pneumatic actuators, pneumatic controllers, I/P converters, air regulators and filters, hydraulic actuators, electro-mechanical actuators
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.**	50.1 Understanding of open-loop control systems – systems that operate without feedback, typically used in simple or non-critical applications

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Number of Questions	Knowledge	Amplification and Guidance
	K50: Open and closed loop systems. First and second order control systems. Proportional–integral–derivative controller (PID controller or three-term controller).	50.2 Knowledge of closed-loop control systems – systems that use feedback to compare actual output with desired output and adjust accordingly 50.3 Awareness of first-order control systems – systems with a single energy storage element, characterised by exponential response and time constant 50.4 Understanding of second-order control systems – systems with two energy storage elements, capable of oscillation and damping behaviour 50.5 Knowledge of Proportional Integral Derivative (PID) controllers – including the role of each term: Proportional (P) – corrects error based on present value, Integral (I) – corrects accumulated past error, Derivative (D) – predicts future error based on rate of change
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K51:** Functions and applications of control and instrumentation systems: programmable logic controller (PLC), Direct Digital Control (DDC), Distributed Control	51.1 Understanding of Programmable Logic Controllers (PLC) – used in process and control applications across manufacturing, infrastructure, power plant operations, water treatment plants, and conveyor belt systems and other types of industrial plants 51.2 Awareness of Direct Digital Control (DDC) systems – used to monitor and control microprocessor-based systems, including HVAC systems, environmental control, and industrial processes

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Number of Questions	Knowledge	Amplification and Guidance
	System (DCS), and Supervisory Control And Data Acquisition (SCADA).	51.3 Knowledge of Distributed Control Systems (DCS) – used for process control and monitoring in large-scale industrial facilities; integrates multiple control systems across sectors such as oil and gas, power generation, chemical processing, and the food and drink industry and other sectors 51.4 Understanding of Supervisory Control and Data Acquisition (SCADA) systems – used to monitor and control industrial processes across large geographic areas; enables real-time data collection, alarm provision, data logging, and historical data analysis in sectors such as utilities, transportation, oil and gas pipelines, and mining and other sectors
1 - 2	**Specialist: Electrical and control and instrumentation engineering maintenance technician.** **K52:** Types of control and instrumentation diagrams.	52.1 Awareness of control and instrumentation diagrams, system commissioning, calibration, modification activities, fault diagnosis for maintenance 52.2 Knowledge of different types of diagrams, including block diagrams, schematic diagrams, wiring diagrams, circuit diagrams, loop diagrams, and P&IDs (Piping and Instrumentation Diagrams) 52.3 Understanding of how to interpret symbols, signal paths, and component relationships within diagrams and circuits 52.4 Knowledge of documentation standards and conventions used in control and instrumentation diagrams (e.g. IEC, ISA)

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Number of Questions	Knowledge	Amplification and Guidance
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.** **K57:** Electricity at Work regulations. IET wiring regulations.	57.1 Awareness of the legal duties placed on employers and employees under the Electricity at Work Regulations 1989 57.2 Understanding of the requirement to prevent electrical danger through safe design, construction, maintenance and use of electrical systems and equipment 57.3 Knowledge of precautions required when working in hazardous environments (e.g. mechanical damage, moisture, corrosive substances) 57.4 Awareness of the need for suitable isolation, earthing, and safe systems of work for protection against excess current (e.g. fuses, circuit breakers) 57.5 Understanding of the competence and authorised personnel approval and maintaining requirements for individuals working on or near electrical systems, including supervision and training needs 57.6 Awareness of safe working practices when working near live conductors, including use of Personal Protective Equipment (PPE) and hierarchy of controls and risk assessment and control measures
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.**	59.1 Understanding of basic circuit terminology including voltage, current, resistance, power, and energy, and their units of measurement (e.g. volts, amps, ohms, watts, joules), as applied in electromechanical systems

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Number of Questions	Knowledge	Amplification and Guidance
	K59: Principles of single phase and three-phase equipment, plant, and systems, the operation of motors and generators, and the use of monitoring and protection equipment.	59.2 Awareness of the function and characteristics of common electrical components (e.g. resistors, capacitors, inductors, switches, fuses) 59.3 Application of Ohm's Law to calculate voltage, current, or resistance in simple series and parallel circuits relevant to fault-finding and maintenance tasks 59.4 Understanding of transformer theory including the role of primary and secondary windings, turns ratio, and voltage transformation principles 59.5 Awareness of single-phase and three-phase power systems and their relevance to industrial electrical and mechanical equipment such as motors, generators, actuators, pumps, and compressors 59.6 Ability to perform basic power calculations using power triangle, awareness of real, reactive, and apparent power and power factor in AC systems 59.7 Understanding of the efficiency of electro-mechanical machines and causes of electrical and mechanical losses 59.8 Awareness of safety implications when working with electrical systems, including safe systems of work, isolation procedures, correct use of test equipment, and function and selection of safety devices and trip settings in accordance with BS 7671:2018 IET Wiring Regulations

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Number of Questions	Knowledge	Amplification and Guidance
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician** **K61** Functions and applications of electrical circuits.	61.1 Understanding of the purpose and function of electrical circuits in industrial maintenance settings, including power distribution, control, and signal transmission and other applications 61.2 Awareness of different circuit types (e.g. series, parallel, combination) and their applications in equipment such as lighting systems, motor starters, and control panels and other electro-mechanical equipment 61.3 Knowledge of how electrical circuits interface with mechanical systems (e.g. motor control circuits, solenoid-operated valves, heating elements, electro-mechanical actuators) to enable automated or semi-automated operation 61.4 Understanding of circuit protection methods including fuses, circuit breakers, mini-circuit breakers (MCBs), residual current devices (RCDs) and overload relays, and their role in maintaining equipment safety and reliability of electro-mechanical systems 61.5 Knowledge of how to interpret basic circuit diagrams and schematics to support fault diagnosis and maintenance activities
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician**	62.1 Awareness of the main types of diagrams used in electromechanical maintenance, including: • Schematic diagrams (showing functional relationships between components)

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Number of Questions	Knowledge	Amplification and Guidance
	K62 Types of diagrams used to represent circuits; symbols and abbreviations used to represent components in electrical schematics.	• Wiring diagrams (showing physical connections and layout) • Block diagrams (showing system-level overviews) • Single-line diagrams (used in power distribution systems) 62.2 Understanding of the purpose and use of each diagram type in fault-finding, installation, and maintenance tasks across electrical and mechanical systems 62.3 Knowledge of standard electrical symbols and abbreviations and drawing conventions used in schematics, including those for resistors, capacitors, switches, relays, motors, transformers, and protective devices 62.4 Awareness of British and international standards for electrical symbols (e.g. BS EN 60617, IEC 60617) and mechanical symbols (BS ISO 14617-2:2025 Graphical symbols for diagrams) 62.5 Understanding of standard engineering drawings BS 8888:2020 Technical product documentation and specification for engineering drawings 62.6 Ability to interpret multi-disciplinary diagrams that combine electrical and mechanical elements (e.g. motor control circuits with mechanical actuators or sensors) 62.7 Understanding of how to use diagrams to trace circuits, identify components, and support safe isolation and testing procedures

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Number of Questions	Knowledge	Amplification and Guidance
		62.8 Awareness of common errors or omissions in diagrams and how to verify accuracy against physical systems during maintenance activities
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician** **K63** Different types of cables; their specifications and application.	63.1 Awareness of common cable types used in electrical and mechanical maintenance environments, including: • Twin and earth (domestic and light industrial) • Steel Wire Armoured (SWA) cable for external use mechanical protection and high-load applications • Flexible cable for portable equipment • Cable strain relief support • Multi-core and single core cables 63.2 Understanding of cable specifications including conductor material, insulation type, voltage rating, current capacity, voltage drop, installation and temperature tolerance in accordance with BS 7671:2018 IET Wiring Regulations 63.3 Knowledge of cable sizing principles, including the impact of load current, installation method, and environmental conditions on cable selection in accordance with BS 7671:2018 IET Wiring Regulations 63.4 Awareness of colour coding standards for conductors (e.g. single phase and three phase to BS 7671:2018 IET Wiring Regulations) and their importance in safe installation and fault diagnosis

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Number of Questions	Knowledge	Amplification and Guidance
		63.5 Understanding of mechanical protection requirements (e.g. use of conduit, trunking, or armoured cable) in environments with vibration, moisture, or physical risk 63.6 Awareness of the implications of incorrect cable selection, including overheating, voltage drop, electromagnetic interference, and non-compliance with regulations 63.7 Understanding of maintenance considerations such as cable inspection, testing for continuity and insulation resistance, and identifying signs of wear or degradation
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.** **K71:** Mechanical principles, terminology, and calculations: stress, strains, bending moment, heat transfer, fluid dynamics.	71.1 Understanding of core mechanical principles – including statics, dynamics, thermodynamics, fluid mechanics, heat transfer, hydraulics, pneumatics and applied mechanics 71.2 Awareness of mechanical terminology – such as force, torque, stress, strain, Young's modulus, pressure, flow, area, velocity, angular velocity, power 71.3 Awareness of mechanical components – such as different types of bearings, gears, pulleys, couplings, spring systems, static and dynamic sealing systems, drive belt systems, clutches, brakes 71.4 Awareness of mechanical equipment – such as engines, turbines, chain drives, belt drives, gear boxes, gear trains, rotating machinery, steam plant 71.5 Knowledge of mechanical calculations – including Newton's

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Number of Questions	Knowledge	Amplification and Guidance
		Second Law, Thermal Expansion, Thermal Contraction, kinetic gas laws of Charles Law and Boyle's Lawand energy, work done, Bernoulli's equation, stress, strain, force, pressure, flow, gear ratios, speed, power, temperature volume, torque and efficiency 71.6 Understanding of engineering units and SI units and SI derived units
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.** **K72:** Function and application of mechanical elements of plant and equipment.	72.1 Understanding of mechanical elements – including the function and application of gears, bearings, shafts, couplings, pulleys, belts, chains, springs, clutches, brakes, and fasteners in plant and equipment 72.2 Awareness of mechanical systems – such as drive systems (belt, chain, gear), transmission systems, rotating machinery, lifting and handling equipment, and mechanical safety systems 72.3 Understanding of mechanical failure modes – including wear, fatigue, corrosion, misalignment, imbalance, and lubrication failure, and how these impact plant performance and reliability 72.4 Knowledge of maintenance techniques – such as inspection, alignment, lubrication, replacement, and adjustment of mechanical components, including use of hand tools, torque tools, and measuring instruments (e.g. micrometers, dial gauges, feeler gauges)

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Number of Questions	Knowledge	Amplification and Guidance
		72.5 Awareness of mechanical interfaces with electrical systems – including motor-driven mechanical systems, electromechanical actuators, limit switches, and sensors used in mechanical assemblies 72.6 Understanding of mechanical drawings and documentation – including interpretation of mechanical schematics, exploded diagrams, component specifications, and maintenance manuals 72.7 Knowledge of safety and compliance – including mechanical isolation procedures, lock-out/tag-out, guarding, and relevant mechanical regulations and standards (e.g. PUWER, LOLER)
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.** **K73:** Pneumatic and hydraulic system principles; Air compressors, hydraulic pumps, filters, regulators, lubricators	73.1 Understanding of Pascal's Law and its application in hydraulic systems 73.2 Awareness of energy conversion principles in pneumatic and hydraulic systems 73.3 Knowledge of pressure generation 73.4 Understanding of flow characteristics and regulation in pneumatic and hydraulic circuits 73.5 Knowledge of air compressor types, operation and maintenance requirements 73.6 Knowledge of hydraulic pump types and operation of positive displacement and non-positive displacement types

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Number of Questions	Knowledge	Amplification and Guidance
		73.7 Knowledge of hydraulic cylinders (single and double acting), hydraulic actuators and operation 73.8 Awareness of the function and maintenance of filters, regulators and lubricators in fluid systems
1 - 2	**Specialist: Electrical and mechanical engineering maintenance technician.** **K79**: Different types of mechanical fasteners and their uses.	79.1 Understanding of fabricated assemblies, permanent joints, non-permanent joints, thread types and forms, splines, consumables for assembly, lubricants, PTFE tape, anti-seize compounds, adhesives, assembly settings torque tightening, tools 79.2 Awareness different types of fasteners, screws, bolts, nuts, washers, fittings, studding, rivets, threaded inserts, couplings, pins, clips, clamps, tie wire, lifting components, tools for assembling and disassembly fasteners, materials, heat treatment, protective finish 79.3 Understanding of different types of fasteners and applications on equipment, machines, and systems
1 - 2	**Specialist**: **Electrical and mechanical engineering maintenance technician.** **K80**: Types of diagrams used to represent mechanical installations and assemblies;	80.1 Types of engineering drawings, diagrams, data for mechanical equipment including assembly drawings, detail drawings, installation drawings, tooling drawings, schematics, and types of projection used in drawings 80.2 Knowledge of engineering drawing standards/codes, conventions, quality compliance, requirements

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Number of Questions	Knowledge	Amplification and Guidance
	symbols and abbreviations used to represent parts in diagrams.	80.3 Use of engineering drawing symbols, drawing conventions for mechanical parts and features, abbreviations used in drawings, use of Computer Aided Design (CAD), 3D models, 2D drawings and symbol libraires

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Multiple-choice Test Roles and Responsibilities

Role	Responsibility
Invigilator	Is typically provided by the employer or training provider. Attend induction training as directed by EEA. Not invigilate an assessment, solely, if they have delivered the assessed content to the apprentice. Invigilate and supervise the apprentice during tests and in breaks during assessment methods to prevent malpractice in line with the EEA's invigilation procedures.
Employer/Training Provider	Ensure that the multiple-choice test is scheduled with EEA for a date and time which allow the apprentice to be well prepared. Follow EEA guidance in setting up and confirming IT provision for the on-screen test.
EEA	Arrange for the multiple-choice test to take place, in consultation with the employer/training provider. Mark multiple-choice test answers accurately according to the mark scheme and procedures.

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Section 3: Grading and Grading Descriptors

Component 1: Observation with questions

The apprentice must demonstrate core KSBs in an integrated way.

A Fail will be awarded if an apprentice has not achieved **all** the Pass descriptors.

To gain a Pass, an apprentice must successfully achieve **all** the descriptors for each KSB, as shown below.

To achieve a Distinction an apprentice must successfully achieve **all** the Pass descriptors and **all** of the descriptors from each of the Distinction boxes.

Pass descriptors for the observation with questions

Observation with questions - Themed KSBs	To achieve a Pass the apprentice must achieve **ALL** of the following:
Core: Organising own work. K4; K5;S2 and S3	Uses planning, prioritising, organising, and time management techniques to plan tasks and identifies and organises resources required to complete tasks with consideration for quality, cost, delivery, and ethical practices. (K4; K5; S2 and S3)
Core: Maintaining workplace health, safety, security, and environmental compliance. K9; K10; K11; K12; K15; S7; S8 S9; S12 and B1.	Identifies potential hazards and risks in the work environment and applies control measures in line with safe systems of work. (K9 and S7) Prioritises safe working practices by applying health, safety, and environmental procedures in compliance with regulations, standards, and guidelines including selection, use, and care of personal protective equipment. (K10; K11; S8 and B1)

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Observation with questions - Themed KSBs	To achieve a Pass the apprentice must achieve **ALL** of the following:
	Follows asset security procedures in line with task and company requirements. (K12, S9) Segregates items for reuse, recycling, and waste in line with the company's recycling and waste management requirements. (K15 and S12)
Core: Using work information and following working practices. K19; K20; K22; K23; K24; S1; S5; S6; S14; S15; S16; S17; S23 and B3.	Reviews and uses information including engineering information to plan and complete tasks. (K19 and S1) Identifies equipment to work on and checks plant configuration is as defined, identifying and highlighting issues with drawings as found in line with company procedures. (S5 and S23) Prepares the work area for maintenance in line with task requirements and company procedures. (S6) Takes ownership for the delivery and quality of work by applying British (BSI) and International (ISO) engineering maintenance standards and procedures to support their company's quality management systems. (K20; K22; K23; S14 and B3) Applies foreign material exclusion procedures in line with task requirements and company procedures. (K24 and S15) Follows maintenance tools and equipment control requirements in line with company procedures. (S16) Reinstates the work area in line with task requirements and company procedures. (S17)

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Observation with questions - Themed KSBs	To achieve a Pass the apprentice must achieve **ALL** of the following:
Core: Completing work records. K25 and S21	Records information for work tasks in line with their company's procedures for documentation control and auditable records. (K25 and S21)
Core: Communicating with others. K29 and S19	Uses verbal communication methods and techniques and industry terminology suitable for the context. (K29 and S19)
Specialist option: Electrical and control and instrumentation maintenance technician - **Conducting planned electrical and control and instrumentation maintenance.** K34; K41; K42; K46; K53; K54; S27; S28; S31; S32; S34; S35; S36; S37; S38; S39; S40; S41; S42 and S43	Confirms the electrical isolation, lockout tagout, method has been applied and tests for dead, in line with task requirements and company procedures. Conducts and confirms isolation of connected services in line with task requirements and company procedures. Re-connects instrumentation power supply, cables, pipework, and services in line with task requirements and company procedures. Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K34; K46; S27; S36 and S43) Selects electrical and control and instrumentation maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation, care and calibration requirements. (K42; K54 and S28) Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of plant, removing and

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Observation with questions - Themed KSBs	To achieve a Pass the apprentice must achieve **ALL** of the following:
	replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K41; S31; S32; S34 and S35) Conducts planned control and instrumentation maintenance in line with task requirements and company procedures including inspecting and testing control and instrumentation systems, checking calibration and making adjustments, checking loop function, setting up and adjusting control and instrumentation systems, cleaning parts, and removing and replacing instruments and sensors. (K53; S38; S39; S40; S41 and S42) Conducts functional testing to confirm operation in line with task requirements and company procedures (S37)
Specialist option: Electrical and mechanical engineering maintenance technician - **Conducting planned electrical and mechanical maintenance** K58; K65; K66; K70; K74; K75; S44; S45; S46; S49; S50; S52; S53; S54; S55; S56; S57; S58 and S59	Confirms safe electrical isolation, lockout tagout, method has been applied and tests for dead in line with task requirements and company procedures. Conducts and confirms isolation of connected services in line with task requirements and company procedures. Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K58; K70; S44 and S45)

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Observation with questions - Themed KSBs	To achieve a Pass the apprentice must achieve **ALL** of the following:
	Selects electrical and mechanical maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation and care requirements. (K66; K75 and S46) Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of plant, removing and replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K65; S49; S50; S52 and S53) Conducts planned mechanical maintenance in line with task requirements and company procedures including checking condition and operation of mechanical aspects of plant and equipment, removing and replacing mechanical parts, examining mechanical parts for defects, setting up and adjusting mechanical aspects of plant, cleaning parts, and lubricating mechanical assemblies. (K74; S55, S56; S57; S58 and S59) Conducts functional testing to confirm operation in line with task requirements and company procedures. (S54)

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Distinction descriptors for the observation with questions

Observation with questions - Themed KSBs	To achieve a Distinction the apprentice must achieve **ALL** of the Pass descriptors and **ALL** of the Distinction descriptors
Core: Organising own work K4; K5 and S2	Justifies their planning decisions in terms of efficiencies they achieved and the balance of quality, cost, delivery, and ethical practice. (K4; K5 and S2)
Core: Maintaining workplace health, safety, security, and environmental compliance K10 and S8	Explains the importance of applying health, safety, and environmental procedures in their work. (K10 and S8)
Core: Using work information and following working practices	NA
Core: Completing work records	NA
Core: Communicating with others	NA

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Observation with questions - Themed KSBs	To achieve a Distinction the apprentice must achieve **ALL** of the Pass descriptors and **ALL** of the Distinction descriptors
Specialist option: Electrical and control and instrumentation engineering maintenance technician - **Conducting planned electrical and control and instrumentation maintenance** K41; K53; S31; S32 S34; S35; S37; S38; S39; S40; S41 and S42	Justifies their approach to planned electrical maintenance. (K41; S31; S32; S34; S35 and S37) Justifies their approach to planned control and instrumentation maintenance. (K53; S38; S39; S40; S41 and S42)
Specialist option: Electrical and mechanical engineering maintenance technician - **Conducting planned electrical and mechanical maintenance** K65; K74; S49; S50; S52; S53; S55; S56; S57; S58 and S59	Justifies their approach to planned electrical maintenance. (K65; S49; S50; S52 and S53) Justifies their approach to planned mechanical maintenance. (K74; S55; S56; S57; S58 and S59)

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Component 2: Interview based on an EPA portfolio

The apprentice must demonstrate core KSBs in an integrated way.

To gain a Pass, an apprentice must successfully achieve **all** the assessment descriptors for each KSB, as shown below.

To achieve a Distinction, an apprentice must successfully achieve **all** the Pass assessment descriptors and **all** descriptors from each of the Distinction boxes.

Interview (based on an EPA portfolio)	To achieve a Pass the apprentice must achieve **ALL** of the following:
Core: Impact of sector on maintenance activities. K1	Explains the impact of the sector that they work in on their maintenance activities. (K1)
Core: Roles and responsibilities. K2; K3; K16; S4; S10 and S20	Outlines their role as a maintenance technician including their limits of responsibility and how they escalate issues in line with company procedures. (K3 and S20) Describes how they respond and adapt to meet demands in their work with different maintenance disciplines and functional areas. (K2 and S4) Describes how they have or would respond in an emergency situation in line with their company's emergency incident procedures. (K16 and S10)
Core: Working sustainability. K14; S11 and B2.	Describes how they consider and apply principles of sustainability when using resources and carrying out tasks to support the UK's net zero commitment. (K14; S11 and B2)

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Interview (based on an EPA portfolio)	To achieve a Pass the apprentice must achieve **ALL** of the following:
Core: Participating in continuous improvement. K26; S25; S26 and B5.	Describes how they have applied continuous improvement (CI) techniques to identify viable suggestions to support their company's CI system. (K26 and S25) Describes planned and unplanned learning and development activities they have carried out and recorded to meet personal development needs, showing a commitment to future CPD. (S26 and B5)
Core: Teamworking. K27; K28; S18 and B4	Describes how they apply team working principles to meet work goals and support inclusivity in line with their company's policy on equity, diversity, and inclusion. (K27; K28; S18 and B4)
Core: Produce written documents. K30 and S22	Describes how they apply written communication techniques to produce or amend documents in their work that are suitable for the context. (K30 and S22)
Core: Digital and information technology. K31 and S24	Describes how they use digital and information technology in their work in compliance with their organisation's cyber security requirements and the General Data Protection Regulation (GPDR). (K31 and S24)
Specialist Option: Electrical and control and instrumentation engineering maintenance technician - **Electrical and control and instrumentation maintenance problem solving and fault finding**	Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures.

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Interview (based on an EPA portfolio)	To achieve a Pass the apprentice must achieve **ALL** of the following:
K43; K44; K45; K55; K56; S29 and S30	Describes how they use control and instrumentation diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common control and instrumentation system failure modes in line with task requirements and company procedures. (K43; K44; K45; K55; K56; S29 and S30)
Specialist Option: Electrical and control and instrumentation engineering maintenance technician - **cable installation and termination** K40 and S33	Describes how they prepare and terminate cables using methods in line with the task requirements and company procedures. (K40 and S33)
Specialist Option: Electrical and mechanical engineering maintenance technician - **Electrical and mechanical maintenance problem solving and fault finding** K67; K68; K69; K76; K77; S47 and S48	Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures. Describes how they use mechanical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common problems relating to mechanical aspects of plant and equipment in line with task requirements and company procedures. (K67; K68; K69; K76; K77; S47 and S48)
Specialist Option: Electrical and mechanical engineering maintenance	Describes how they prepare and terminate cables using methods in line with the task requirements and company procedures. (K64 and S51)

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Interview (based on an EPA portfolio)	To achieve a Pass the apprentice must achieve **ALL** of the following:
technician - **cable installation and termination** K64 and S51	
Specialist Option: Electrical and mechanical engineering maintenance technician - **Bench fitting techniques** K78 and S60	Describes how they apply bench fitting techniques including cutting threads, mechanical fitting, and joining in line with task requirements and company procedures. (K78 and S60)

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Distinction descriptors for the interview based on an EPA portfolio

Interview (based on an EPA portfolio)	To achieve a Distinction the apprentice must achieve **ALL** of the Pass Descriptors and **ALL** of the Distinction Descriptors:
Core: Impact of sector on maintenance activities	NA
Core: Roles and responsibilities	NA
Core: Working sustainability. K14; S11 and B2	Justifies the application of sustainability practices in maintenance activities. (K14, S11 and B2)
Core: Participating in continuous improvement. K26 and S25	Justifies the potential impact of the improvement suggestions with consideration to benefits and potential risks. (K26 and S25)
Core: Teamworking.	NA
Core: Produce written documents.	NA
Core: Digital and information technology.	NA
Specialist Option: Electrical and control and instrumentation engineering maintenance technician - **Electrical and control and instrumentation maintenance problem solving and fault finding** K43; K55 and S30.	Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. Justifies diagnostic methods they have used in the identification and rectification of control and instrumentation system failure modes. (K43; K55 and S30)

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Interview (based on an EPA portfolio)	To achieve a Distinction the apprentice must achieve **ALL** of the Pass Descriptors and **ALL** of the Distinction Descriptors:
Specialist Option: Electrical and control and instrumentation engineering maintenance technician - C**able installation and termination**	NA
Specialist Option: Electrical and mechanical engineering maintenance technician - **Electrical and mechanical maintenance problem solving and fault finding** K67; K76 and S48	Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. Justifies diagnostic methods they have used in the identification and rectification of issues relating to mechanical aspects of plant and equipment. (K67; K76 and S48)
Specialist Option: Electrical and mechanical engineering maintenance technician - **Cable installation and termination**	NA
Specialist Option: Electrical and mechanical engineering maintenance technician - **Bench fitting techniques**	NA

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Component 3: Multiple-choice test

The following grade boundaries apply to the multiple-choice test assessment:

Grade	Minimum mark	Maximum mark
Fail	0	34
Pass	35	50

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Overall grading

The apprenticeship will be graded fail, pass, merit or distinction. The final grade will be determined by collective performance in the three assessment components.

In order to gain a pass, an apprentice must achieve at minimum of a pass in each EPA component. A pass represents full competence against the standard. To achieve a merit grade, an apprentice must achieve a distinction in the observation with questions and a pass in the other assessment components. To achieve an overall distinction the apprentice must achieve a distinction in the observation with questions and interview based on an EPA portfolio and a pass in the multiple-choice test.

The observation with questions, interview based on an EPA portfolio and multiple-choice test are all marked separately and awarded a fail, pass, or distinction.

The multiple-choice test is based on the percentage score achieved. The grade and mark for the observation with questions and interview is based on the number and level of descriptors achieved.

The overall grade for the EMT Dual-Discipline Standard is based on the grades in individual components as follows:

Observation with questions	Interview based on an EPA portfolio	Multiple-choice Test	Overall grading
Distinction	Distinction	Pass	Distinction
Distinction	Pass	Pass	Merit
Pass	Distinction	Pass	Pass
Pass	Pass	Pass	Pass
Fail	Any grade	Any grade	Fail
Any grade	Fail	Any grade	Fail
Any grade	Any grade	Fail	Fail

The grading descriptors that will be applied for each assessment descriptors along with additional details can be found in Section 3 of this Specification.

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Section 4: Resits and retakes

Apprentices who fail one or more EPA components can re-sit or re-take the failed component at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, but a re-take does. Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and EEA should agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

Failed assessment methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

The apprentice will get a maximum EPA grade of a pass if they need to re-sit or re-take one or more assessment methods, unless EEA determines there are exceptional circumstances.

The EEA resit and re-take policy can be found at:
https://energyenvironmentawards.co.uk/wp-content/uploads/2025/08/Re-sit-and-Re-take-Policy-v-6.0.pdf

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Section 5: Practical Observation Guidance

Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form

Purpose

EEA must approve employer's observation with questions assessment. The purpose of the approval is to provide EEA with assurance that the practical assessment will be conducted in line with the EMT – dual discipline assessment plan. The approval must take place before the first observation with questions assessment is carried out. To access the service, see Appendix D, EMT – Dual Discipline Supporting Documents 'Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form.'

Submitting the form to EEA

To obtain approval, employers must complete the Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval Form'. This must be submitted to the EEA Service Delivery Team for approval at least 2 months before Gateway.

EEA Approval Process

Once the EMT – dual discipline observation with questions planning and approval form has been received the approval process will be conducted by EEA. The outcomes will be shared with the employer/training provider no later than 5 working days following the review.

The employer/training provider must ensure:

- the task(s) being observed is suitable and sufficient and is to be carried out at a suitable premises. Site access for the assessor and any specific requirements must be advised in advance
- all equipment and resources are suitable for the task, in good safe working condition and certification where applicable

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Please be aware:

- Observation with questions approval does not guarantee the apprentice will pass the assessment
- No health and safety risk assessment has been carried out by EEA
- EEA approval does not remove any of the training provider obligations to ensure full coverage of the standard, and full compliance with relevant legislation
- EEA approval is based only on information supplied and is not a guarantee that the observation tasks/briefs, selected plant/machinery/equipment on the day of the assessment will be sufficient for the observation with questions
- The information provided in the Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form must not be shared with the apprentice

Preparing for the Observation with questions

Where possible, the employer/training provider should provide the apprentice with the opportunity to carry out a practice observation with questions as close to the real assessment described in Section 2 of the specification (Component 1).

The employer/training provider should prepare a practical task similar to (but not identical to) the tasks being used for the live assessment. A suitable person should be chosen to play the part of the assessor.

A template is provided to help ensure that the activities assessed during the practical assessment will give complete coverage of the standard. See Appendix E, EMT – Dual Discipline Supporting Documents 'Practice Observation with Questions Template.'

Preparing for the Interview based on an EPA portfolio

An Interview based on an EPA portfolio should take place between the apprentice and the person acting the role of an assessor. The apprentice should draw on evidence from their EPA portfolio during the discussion.

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Guidance on an EPA Portfolio

Throughout the on-programme part of their apprenticeship, the apprentice must compile an EPA portfolio to support them in the interview. The Interview will draw on the evidence contained in the EPA portfolio.

The EPA portfolio should reflect their individual experiences and the activities carried out during this period and meet the requirements outlined in the assessment plan.

A completed EPA portfolio is one of the Gateway requirements.

The EPA portfolio is **not assessed**. It serves the following purposes:

- It provides the opportunity for each apprentice to provide examples of the knowledge, skills and behaviours that will be assessed in the interview
- A carefully prepared EPA portfolio will support the apprentice during the interview
- It allows the assessor to review the EPA portfolio before the interview to help focus and contextualise the questions the apprentice will be asked

The EPA portfolio is a record of how each apprentice demonstrated the knowledge, skills and behaviours that are assessed in the interview. Apprentices will have access to their EPA portfolio during the interview. When the employer/training provider registers their apprentices with EEA they will have access to the EPA Portfolio Template.

The role of the employer/training provider

Employer/training providers are expected to support the apprentice in preparing their portfolio by:

- providing clear instruction and deadlines to allow the apprentice to plan and compile their portfolio in preparation for the Gateway meeting
- advising on which pieces of evidence to select
- authenticating evidence as valid
- signing off the EPA portfolio
- submitting the portfolio to EEA as part of Gateway requirements.

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What to expect in the practice interview?

The practice interview will be based on the EPA portfolio which will provide the apprentice with the opportunity to practice discussing their KSBs gained throughout their on-programme and by referring to the evidence from their portfolio using their responses to the tasks and associated evidence. A suitable person should be chosen to play the part of the assessor.

A practice interview template is provided to help prepare the appropriate questions to ask and to record the apprentices' performance. See Appendix F, EMT – Dual Discipline Supporting Documents 'Practice Interview Based on an EPA Portfolio Template.'

As part of the practice exercise, apprentices should have access to their EPA portfolio to support their responses.

Preparing for the multiple-choice test

While on-programme, the employer and/or training provider should brief the apprentice on the areas to be assessed by the multiple-choice test, as detailed in Section 2 in this specification. It is good practice to identify the areas within the learning programme where the relevant knowledge is delivered, ensuring that apprentices are aware that elements of these might come up in the test.

The multiple-choice test is aligned to the standard rather than a specific job role that the apprentice may be doing. The questions have been written to reflect the EMT - dual discipline and specialist role as a whole and not focussed on specific plant, machinery, or employer-specific processes.

In readiness for end-point assessment, the apprentice should complete a practice multiple-choice test. This should be undertaken in advance of the live multiple-choice test, with enough time to mark the test, and provide feedback to the apprentices. A practice multiple-choice test is available as a printable copy – See Appendix C, EMT - Dual Discipline Supporting Documents 'Practice Multiple-choice Test.'

For maximum effect, ensure the test is taken in exam conditions similar to those that will be experienced in a live test.

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Section 6: Authenticity and security of apprentice work

The apprentices must be advised by their training provider and employer that copying of any work (whether it is from another apprentice or from internal, external documents or source) and presenting it as their own will be deemed as malpractice and will lead to their work being disqualified. Apprentices must not share their work or allow any person to copy their work as this is not allowed and would also be deemed as malpractice.

In signing off the portfolio, training providers and employers must be satisfied that the evidence in the portfolio is:

- **adequate**: evidence must cover all relevant KSBs within the assessment plan. Adequate does not mean a large quantity of evidence. The evidence should focus on quality rather than quantity
- **authentic**: apprentices must be able to confirm and talk about the evidence that they submit with the independent assessor, appointed by EEA. It is vitally important apprentices only submit evidence relating to them
- **appropriate**: all evidence must be relevant to the KSBs assessed during the interview based on an EPA portfolio
- **recent and up to date**: all evidence must be linked to the tasks in the EPA portfolio template. The evidence must be recent and current which demonstrate the apprentice's competence. The independent assessors, appointed by EEA, will assess current competencies. Apprentices must gather evidence during their on-programme training

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