EPA Specification Maintenance and Operations Engineering Technician – Control and Instrumentation technician

EPA Specification Section 5.3 – The Technical Interview

- Preparing the evidence portfolio
- Preparing for the Technical Interview
- Criteria and Grading

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and yourapprentices for end-point assessment. However, if you haveany further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

Introduction

The Technical Interview is the final stage of the end-point assessment. It will last approximately two hours and no longer than two and a half hours. It is based on the contents of the evidence portfolio which may be compiled throughout the apprenticeship. The evidence should be sufficient to demonstrate that the apprentice can apply the knowledge, skills and behaviours required, namely:

- All core knowledge CK1, CK2, CK3 and CK4
- Core skills CS4, CS6, CS7 and CS8
- All the control and instrumentation technician specific skills CI1, CI2, CI3, CI4 and CI5
- Behaviour B5, critical reasoning

(see Section 4 for the references to the standard)

Please note that the portfolio is NOT assessed, but the apprentice can use it to support themselves in answering the interview questions. The interview questions will focus on each of the elements of the standard listed above so it is important that the apprentice is completely familiar with each of them. The portfolio must be submitted to EUIAS at least two weeks prior to the technical interview.

Typically, the portfolio will be based on 3-5 substantial jobs completed towards the end of their training. Prior to the technical interview, the assessor will review the portfolio. Although questioning will cover ALL the elements of the standard listed above, they will prioritise areas according to what they see in the portfolio.

The apprentice can achieve a Pass, a Merit or Distinction. If they do not achieve a pass, they will be failed. Thecriteria for marking the technical interview are shown below.

Preparing for the Technical Interview

Apprentices should be prepared for the technical interview with 'mock interview' opportunities (see section 6). This should take place near or at the end of their training programme when they are finalising their portfolio. Apprentices should beguided to index their portfolios, referencing each part of their evidence to the relevant part of the standard. The reference should direct the assessor to the relevant page, and page section within the portfolio.

The interview will focus on each knowledge and skill area as listed in the grading criteria table below, and each question will relate to one of the scenarios listed:

- Scenario 1 – Position, assemble, install and dismantle plant and equipment including calibration and configuration
- Scenario 2 – Carry out planned, unplanned and preventative maintenance procedures including calibration and configuration
- Scenario 3 – Diagnose and determine the cause of faults and Replace, repair and/or remove components and ensure it is returned to operational condition

The assessor will ask you a set of questions to explore your levels of skills, knowledge and behaviours when completing activities in each scenario. You can support your answers with reference to your evidence portfolio.

Guidance for preparing for the Technical Interview is outlined in Section 6 "Guidance – setting up a practice Technical Interview". In particular, apprentices should be made aware of the grading criteria for Pass, Merit and Distinction to enable them to achieve to their full potential.

Grading the Technical Interview

The grading criteria are described in the following pages. All pass criteria must be achieved in order to achieve a Pass.

The criteria for Merit and Distinction carry different weightings depending on which element of the standard they relate to. These weightings are applied using marks, as described in the following table. A minimum of two criteria must be achieved for each element of the standard in order to achieve the available marks.

The Merit and Distinction for the Practical Observation are determined by the total number of marks achieved.

Technical Interview Grading

The Technical Interview is graded by an independent assessor (technical expert) appointed by the EUIAS. The following tables explain the criteria that are applied in order to get a Pass, a Merit and a Distinction.

To achieve a PASS for the Technical Interview, a Pass is required in ALL relevant elements, including all skills from the specialist pathway

Relevant Element:	Core Knowledge CK1	Core Knowledge CK2	Core Knowledge CK3	Core Knowledge CK4	Core Skill CS5	Core Skill CS6	Core Skill CS7	Core Skill CS8	Behaviour B5	ALL specialist role skills CI1 – CI5
ALL Pass criteria must be achieved	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

To achieve a **MERIT or DISTINCTION for the Technical Interview**, all Pass criteria must be achieved PLUS a minimum number of merit and distinction marks as described in the below

Relevant Element:	Core Knowledge CK1	Core Knowledge CK2	Core Knowledge CK3	Core Knowledge CK4	Core Skill CS5	Core Skill CS6	Core Skill CS7	Core Skill CS8	Behaviour B5	ALL specialist role skills CI1 – CI5
ALL Pass criteria must be achieved	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Marks achieved for 2 or more Merit criteria	2	3	1	1	5	1	5	2	None	1 mark for each, maximum 5
Marks achieved for 2 or more Distinction criteria	1	1	1	1	2	None	2	2	None	1 mark for each, maximum 5

Merit is achieved by achieving all Pass criteria PLUS a further 15 Merit and Distinction marks, in any combination.

Distinction is achieved by achieving all Pass criteria PLUS a further 25 Merit and Distinction marks, in any combination.

The following section contains the detailed grading criteria for Pass, Merit and Distinction, for the Technical Interview.

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CK1 First principles relating to the operation and maintenance of appropriate plant and equipment	• A working knowledge of the principles of operation for the range of plant/equipment they are responsible for • The primary purpose of the range of plant / equipment worked on e.g. what the plant / equipment worked on does • How the plant / equipment interacts within the overall system • The typical characteristics of healthy and unhealthy operation for the range of plant/equipment worked on and how to identify the difference • How they have used their knowledge of plant and equipment operating / maintenance principles to support their work decisions / activities	• A detailed understanding by explaining additional technical detail of the operating principles of the plant/equipment they are responsible for e.g. operating limits, tolerances, restrictions, effects on system • A detailed understanding by explaining additional technical detail of the function / interaction of the plant / equipment within the overall system e.g. synchronisation, effects on system • How they have used their knowledge of plant and equipment operating / maintenance principles to improve or enhance operational activities	• An excellent knowledge and thorough understanding of the relevant engineering principles relative to the operation and maintenance of plant and equipment encountered in their job role • Evidence of conducting supporting technical analysis to gain a greater understanding of (a or b) • the operating principles of plant/ equipment worked on • the function / effect of the plant / equipment within the overall system • Conducting technical research into the effects of new technologies on current / future maintenance requirements/methodologies

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CK2 Relevant industry health and safety standards, regulations, and environmental and regulatory requirements	• A working knowledge of the relevant HS&E regulations and standards and how they impact the overall operation • A clear understanding of their responsibilities and those of others under the relevant Company policies and procedures which apply to the range of work undertaken and describe why they are required • A knowledge of the Company process/s and/ or procedures for achieving and maintaining safety when working on systems within their work role and how they impact the work e.g. safe systems of work, documentation • A clear understanding of the purpose of conducting risk assessments and the factors which affect the critical reasoning when making risk assessment decisions • A knowledge of the Company procedure/s for reporting safety concerns and emergencies	• A detailed understanding of the relevant HS&E regulations and standards by explaining additional technical detail e.g. how they influence how the work is planned and/or conducted • Conducting reviews of work HS&E arrangements and their applicability and adapting them for changing circumstances whilst still maintaining safety • How they have readily accepted additional HS&E responsibility / autonomy to maintain / improve work safety standards	• Excellent and thorough HS&E knowledge and understanding in relation to the wider impact of relevant industry working practices and regulations for their work activities • How they have taken a leading role in identifying HS&E deficiencies and then implementing the appropriate solution/s in line with • Company policies / procedures • How they have challenged unsafe behaviour / practices using appropriate techniques

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CK3 Maintenance and operational practices, processes and procedures covering a range of plant and equipment	• A working knowledge of the maintenance requirements for the range of plant/ equipment worked on within their job role • A working knowledge of the Company's operational processes and procedures and how these have affected / influenced their maintenance work • Their planning process for conducting maintenance operations and the factors which have influenced their critical reasoning / decision making when planning their work • A working knowledge of the range and type of test procedures which they have used to confirm their work has met with Company operational requirements and standards • A knowledge of how their maintenance activities have impacted plant / equipment / others	• A detailed knowledge of the Company maintenance practices by explaining additional technical detail for maintenance procedures on plant/equipment • A detailed knowledge of the Company operational processes and procedures which affect maintenance operations by explaining additional operational detail • A detailed knowledge of the range of testing procedures and the implications of the results obtained	• An excellent and thorough knowledge and understanding of relevant maintenance and operational practices / procedures for their job role • An ability to analyse and provide valid justification for the Company's maintenance procedures and/or operational practices for maintenance work on plant and equipment • A detailed technical / commercial understanding of the effects of conducting maintenance procedures on Company plant / equipment e.g. cost, reliability, availability, sustainability

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CK 4 The relevant engineering theories and principles relative to their occupation	• A working knowledge of the range of relevant operational theories and principles which underpin their work • A working knowledge of the basic effect / influence of the relevant operational theories and principles which directly underpin their work activities • The benefits of being able to identify and apply the differing operational theories and principles in relation to their job role e.g. maintenance inspections, fault finding • A working knowledge of how to apply the relevant operational formulae which can be used to support their work activities	• A detailed knowledge of the relevant operational theories and principles which have supported and/or influenced their work activities • How they have used relevant operational theories and principles to support / influence their work decisions / activities • Their inclusion of operational formulae / theories / principles to support their technical explanations in relation to their work activities	• An excellent and thorough knowledge and understanding of the relevant operational theories and principles relative to plant and equipment in their job role • How they have used their understanding of relevant operational theories and principles to make suggestions which have influenced or led to an improved performance • How they have conducted further technical research which is based on relevant operational theories and principles to support the effects of current or future technologies

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CS5 Locate, and rectify faults on plant and equipment	• A working knowledge of the Company policies and procedures for the location of faults on plant and equipment worked on • A clear understanding of the Company policies and procedures in relation to achieving the safe isolation of equipment from relevant sources of energy and maintaining safety from the system • How they have used tools / equipment / techniques to inspect and identify faults on plant/ equipment and develop sound solutions while recognising and defining problems • How they have used tools / equipment / techniques to repair faults and confirm the rectification to the quality standards required by Company policies / procedures • How they have recorded / reported the results of fault-finding activities in line with Company procedures	• A detailed knowledge of the Company processes and procedures by explaining additional technical detail for the fault location methods / procedures conducted on plant/ equipment/systems • A detailed understanding of the tools and equipment that can be used to identify and locate faults on plant/equipment/systems • Their ability to take a lead in fault finding/ rectification activities and accept additional responsibility / autonomy for the fault work undertaken	• An excellent knowledge / understanding in relation to fault location / rectification procedures within their job role • How they have used a range of methods to locate, and rectify faults on plant and equipment, with a detailed explanation / justification of their chosen methods • How they have used their knowledge of fault location / rectification to improve / influence work outcomes

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CS6 Read, understand and interpret information and work in compliance with technical specifications and supporting documentation	• A working knowledge of the range of information which can be gained from Company policies and procedures which affect their work • A working knowledge of the range and type of technical information / specifications available and how they are used to support work activities • How they have used Company work information and technical specifications to conduct / support their work activities • Describe how they have used Company information to record/ report the results of work carried out in line with Company procedures	• How they have taken a lead in interpreting / relaying technical information to progress work or support others understanding • How they have questioned / clarified information which was unclear or incorrect • How they have reported / updated information which was not technically correct / accurate	NONE

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CS7 Inspect and maintain appropriate plant and equipment to meet operational requirements	• How they have planned inspection and maintenance operations and the factors which influenced their critical reasoning / decisions during their planning process • How they have implemented / complied with Company operational processes and procedures during their conducted inspection and maintenance work • How they have used tools / techniques / equipment to conduct maintenance inspection and maintenance procedures on a range of plant / equipment to meet Company standards • How they have used test equipment / procedures on plant / equipment to confirm that the work completed met with Company operational requirements • How they have reported / recorded the outcome of their inspection and maintenance operations	• Their ability to explain in detail the range of skills, knowledge and behaviours they have used to support their conducted inspection / maintenance operations • How they have pro-actively worked with others to resolve problems during inspection / maintenance operations which supported work progression / performance • How they have taken action to report or deal with issues of non-conformity or non-compliance during inspection / maintenance work operations	• An excellent knowledge / understanding in relation to inspection / maintenance procedures within their job role • Their ability to explain / justify the Company inspection and maintenance procedures used for a range of plant and equipment • How they have taken a lead in accepting additional responsibility / autonomy to improve the outcome of inspection / maintenance operations

Core Knowledge			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CS8 Communicate, handover and confirm that the appropriate engineering process has been completed to specification	• A working knowledge of their role and responsibilities in the handover of the system / equipment / plant back to operational service • A working knowledge of the Company process for the handover of plant / equipment which has been worked on • How they have completed the required checks / tests to confirm the plant / equipment / system worked on meets operational requirements before conducting the handover process • How they have completed the handover of plant / equipment in line with relevant Company policies and procedures • How they have confirmed the recipient/s of the handover process fully understand any critical information given • How they have completed the Company process for reporting / recording the handover of plant / equipment back into service in line with Company procedures	• How they have taken a pro-active lead in the handover process by effectively communicating the detail of handover arrangements with stakeholders • Their ability to develop positive professional relationships with individuals to support the handover process and resolve any issues within their role responsibility • How they have adapted their communication method / style to better suit the changing circumstances / needs of the work	• How they have consulted / involved team members / other relevant persons to achieve greater understanding and improved performance • Their ability to actively address conflict / resolve problems with positive outcomes to build positive relationships and • Their ability to effectively communicate technical information across a wide range of stakeholders e.g. colleagues, management, briefings/meetings, external clients

Specialist Pathway Skills: Control and Instrumentation technician – apprentice is assessed on **all** the specialist pathway skills during the Interview			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CI1 Position, assemble, install and dismantle plant and equipment which will include instrumentation and control of temperature,pressure and flow systems to agreed specifications	• A working knowledge of their responsibilities for the range of work activities within their job role • How they have used Company policies / procedures / specifications to conduct a range of position, assemble, install and dismantle work activities • How they have used tools and equipment to conduct a range of position, assemble, install and dismantle activities in compliance with specifications and regulatory requirements • How they have conducted the required checks / test procedures to confirm the completed work meets Company / operational requirements • How they have used critical reasoning to identify and resolve technical problems within their control effectively during their range of work activities • How they have reported / recorded the work conducted & returned the work area to a safe condition in line with Company procedures	• A detailed understanding of the range and technical requirements of the plant and equipment worked on • A detailed technical understanding for the range of methods / techniques used for their position, assemble, install and dismantle work activities • A detailed technical understanding for the factors which can affect their critical reasoning when making decisions to resolve technical problems • How they have taken a pro-active lead in organising / controlling their conducted work activities which has led to a successful completion	• An excellent knowledge and understanding in relation to the range and technical requirements of the plant and equipment worked on • Their ability to explain / justify the Company methods /processes / procedures used for the range of plant and equipment worked on • How they have taken a lead in accepting additional responsibility / autonomy to improve the outcome of their position/ assemble / install / dismantle work activities

Specialist Pathway Skills: Control and Instrumentation technician – apprentice is assessed on **all** the specialist pathway skills during the Interview			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CI2 Carry out planned, unplanned and preventative maintenance on plant and equipment	• A working knowledge of their responsibilities for the range of work activities within their job role • How they have used Company policies / procedures / specifications to conduct a range of maintenance procedures work activities • How they have used tools and equipment to conduct a range of maintenance procedures in compliance with all Company health, safety and environmental processes, policies and regulatory requirements • How they have conducted the required checks / test procedures to confirm the completed maintenance work meets Company requirements • How they have used critical reasoning to identify & resolve technical problems within their control effectively during their range of work activities • How they have reported / recorded the work conducted & returned the work area to a safe condition in line with Company procedures	• A detailed understanding of the range and technical requirements of the plant and equipment worked on • A detailed technical understanding for the range of methods / techniques used for maintenance work undertaken • A detailed technical understanding for the factors which can affect their critical reasoning when making decisions to resolve technical problems • How they have taken a pro-active lead in organising / controlling their conducted work activities which has led to a successful completion	• An excellent knowledge and understanding in relation to the range and technical maintenance requirements of the plant and equipment worked on • Their ability to explain / justify the Company maintenance methods / processes / procedures used for the range of plant and equipment worked on • How they have taken a lead in accepting additional responsibility / autonomy to improve the outcome of their maintenance work activities

Specialist Pathway Skills: Control and Instrumentation technician – apprentice is assessed on **all** the specialist pathway skills during the Interview			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CI3 Replace, repair and/or remove components in plant and equipment and ensure its return to operational condition AND CI4 Diagnose and determine the cause of faults in plant and equipment	• A working knowledge of their responsibilities for the range of replace / repair activities undertaken • How they have used Company policies / procedures / specifications to conduct a range of replace / repair work procedures • How they have used tools and equipment to conduct a range of replace / repair procedures in compliance with all Company health, safety and environmental processes, policies and regulatory requirements • How they have conducted the required checks / test procedures to confirm the plant / equipment worked on can be returned to operational service • How they have used critical reasoning to identify and resolve technical problems within their control • How they have returned plant / equipment worked on to operational service in line with Company procedures	• A detailed understanding of the methods and technical requirements for the range of plant and equipment replaced / repaired • A detailed technical understanding for the range of causes and effects which lead to plant and equipment being replaced / repaired • A detailed technical understanding for the factors which can affect their critical reasoning when making decisions to resolve technical problems • How they have taken a pro-active lead in organising / controlling their conducted replace / repair work activities which has led to a successful completion	• An excellent knowledge and understanding in relation to the range and technical requirements of the plant and equipment replaced / repaired • Their ability to explain / justify the Company methods /processes / procedures used for the range of plant and equipment replaced / repaired • How they have taken a lead in accepting additional responsibility / autonomy to improve the outcome of their replace / repair work activities

Specialist Pathway Skills: Control and Instrumentation technician – apprentice is assessed on **all** the specialist pathway skills during the Interview			
Standard	Pass criteria – all to be met	Merit criteria – two to be met	Distinction criteria – two to be met
CI5 Calibrate and configure instrument and control systems	• A working knowledge of their responsibilities for the range of diagnostic activities undertaken • How they calibrated instruments to a given specification • How they planned calibration activities to minimise operational conditions • How they selected the appropriate tools and equipment for specific calibration and/or configuration activities • A working knowledge of the company procedures and regulatory requirements that must be followed when calibrating and/ or configuring instruments • How they applied a calibration that was both accurate and consistent • How they recorded the outcomes of calibration and/or configuration activities	• A detailed knowledge of the principles of calibration and/ or configuration of plant and equipment • Detailed knowledge of the ways to minimise risk of all planned shutdowns during calibration and/ or configuration activities • How they would work with in a team to identify improvements on calibration and/or configuration activities • How they would report any potential improvements associated with calibration and/or configuration activities	• A deeper and knowledge of equipment parameters, tolerances and operational specifications • How they would identify and implement potential changes to improve the efficiency of calibration and/or configuration activities • How they reported or dealt with instruments that failed to meet calibration and/or configuration compliance • How they took an autonomous role during calibration and/or configuration activities