

Introduction

This assessment plan sets out the assessment requirements for the following apprenticeship standard:

Fire, emergency and security systems – technician (level 3)

The assessment plan supports delivery of the Fire, Emergency and Security Systems Technician standard. Its purpose is to inform those involved in delivery of the apprenticeship by:

- explaining **what** will be assessed
- explaining **how** the apprentice will be assessed
- indicating **who** will carry out the assessment
- proposing **quality assurance** arrangements to make sure that end-point assessments are reliable and consistent across different locations, employers, and training and assessment organisations.

Summary of Assessment

The Fire, emergency and security systems technician apprenticeship standard reflects the needs of employers who employ apprentices to carry out the design, installation, commissioning and maintenance of electronic systems in and outside simple and complex premises to protect individuals, homes and properties from risk and danger. It is an integrated programme of knowledge and skills acquisition, developed alongside core behaviours expected of a competent developing professional operating in a regulated field. The award of the apprenticeship certificate will signify a recognition of competence in a role and enable progression to higher levels of skills development.

This assessment strategy, when delivered by high-quality learning providers and assessed by independent assessment organisations will ensure that candidates can progress towards the achievement of the apprenticeship as a step in a career in the fire, emergency and security systems sector. Employer-led approaches for quality assurance and governance of ongoing professional development are being considered, including links between the apprenticeship and a professional body. End-point assessment organisations (EPAOs) referenced within this plan will appear on the apprenticeship providers and assessment register (APAR).

It should be noted that *all* components as part of the end-point assessment will be made available to every assessment organisation registered or recognised for the purpose of end-point assessment.

Apprentices are recommended to undertake a structured programme of study in a suitable employment setting and complete the on-programme training and assessment as part of a high-quality programme. Apprentices can only attempt the separate, mandatory end point assessment once the mandatory pre-requisite gateway components have been attempted and achieved.

The standard has been developed at level 3 and outlines the skills, knowledge and behaviour requirements of this occupation. The Apprenticeship will typically take 36 months to complete.

It is expected that the core skills, knowledge and behaviours will be acquired by the apprentice in the first two years with the specialist option undertaken and completed in the final third year.

The apprentice must be assessed against the core and *one* of the four distinct options, chosen by the apprentice and employer jointly:

- fire
- security
- fire and emergency lighting
- fire and security

This assessment plan clearly outlines the principles of assessment against the apprenticeship standard.

The main objective of the end-point assessment is to provide a high quality cost effective means of measuring apprentices' competence in the final three months of their apprenticeship.

Employers expect that assessment under this apprenticeship will be proportionate, consistent and reliable.

The synoptic end point assessment will include three distinct components. First, the completion of an extensive knowledge test answered through a multiple choice exercise taken as an online or computer based test. This knowledge test will contain a standard set of questions from the common core of the apprenticeship standard and additionally questions selected from the chosen option pathway. The second component is a professional discussion which is undertaken at the same time as the third component which is a practical observation. To achieve final certification, the apprentices must have completed and achieved these end point assessments in addition to the gateway and the structured on-programme training phase that includes mandated units of achievement in line with employer's requirements. The end point assessment will demonstrate that the apprentice can apply their knowledge, skills and behaviours in an integrated way and will satisfy the requirements for the award of an apprenticeship certificate.

Delivery of training and any qualification-based assessment up to the end point will be considered as being on programme. The end-point assessment will be the only assessment that can count towards the achievement of the apprenticeship certificate.

On-Programme Training

The occupation has a significant and important requirement to comply with a range of mandatory regulations and standards, including safety and working with electrical components and emergency equipment on behalf of clients for safety and insurance purposes. It is strongly recommended that the apprenticeship should be structured around a training period that conforms to a closely managed programme of study. The underpinning training will allow flexibility for employers and work places whilst maintaining the integrity of assessment and compliance with regulatory requirements.

The estimated 36-month training period should ordinarily include a wide range of training to include critical health and safety knowledge for the achievement of the electrotechnical certification scheme (ECS) card (CSCS affiliated) for employment purposes, with regular assessment to ensure a deep and thorough understanding, with a clear demonstration of competence before being allowed to attempt the end-point assessment.

Combined knowledge and workplace units of achievement will be developed by the employer group and an awarding organisation and are recommended to be undertaken in the workplace during the on-programme period (the units of achievement documents will be available at www.apprentices4fs.com). These units support the achievement of the gateway to attempt the synoptic assessment. These units are under development and will focus on the following themes:

- technical knowledge as required in the industry. Assessment will be via online tests and workplace observation
- units will be assessed through portfolio building, mini projects that align to professional body requirements
- progress observation on-site throughout the training period

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Synopsis End-Point Assessment Overview									
Mandatory Assessment Component	Knowledge Skills Behaviours	Grading	Overall Apprenticeship Weighting	Component Weighting Core	Component Weighting Option	Assessment Duration	When	Where	By Whom
Knowledge test (underpinning knowledge)	Knowledge only	(Fail) Pass Distinction	20%	20%	20%	Two-day assessment centre (day 1)	Final 12 weeks of the apprenticeship	Controlled test at an assessment centre	EPAO
Practical skills test observation	skills knowledge behaviours	(Fail) Pass Distinction	60%	60%	60%	<i>Fire or security option</i> two-day assessment centre (day 1 core and day 2 option) <i>fire and emergency lighting option</i> (day 1 fire detection and alarm + Day 2 Emergency Lighting) <i>Fire & Security Option</i> (Day 1 Fire + Day 2 Security)	Final 12 weeks of the apprenticeship	EPAO assessment centre	EPAO
Professional discussion (applied knowledge)	behaviours skills knowledge	(Fail) Pass Distinction	20%	20%	20%	As above, in conjunction with skills test	Final 12 weeks of the apprenticeship	EPAO assessment centre	EPAO
Total percentage weighting			100%	100%	100%				
<p>A pass will be considered as the minimum attainment to achieve an apprentice certificate. Candidates who excel (score 50 or more correct answers) in the end-point assessment can achieve a grade of distinction.</p>									
On-programme Assessment									

There are two on-programme pre-requisites that allow candidates to progress to the end-point assessment gateway.

- The first is the completion of the ECS health and safety assessment test for the electrotechnical certification scheme (ECS) card (CSCS and its affiliated schemes that have been deemed by the CLC (construction leadership council) under BIS, to be mandatory for access to public procurement and or major infrastructure projects), as well as the recommended combined knowledge and workplace units of achievement.
- The second is a self-assessment checklist as part of the end-point assessment gateway to determine if the apprentice is ready to undertake the end-point assessment components. It is unlikely that an apprentice could successfully pass the end-point assessment without having achieved the required standard for the award of the units of achievement.

Assessment Gateway

Before the apprentice is adjudged ready to undertake the end-point assessment, it is strongly recommended and expected that they should have completed all of the units of assessment and the self-assessment exercise as required in the on programme assessment.

Gateway to the End Point Assessment

Additionally, it is a requirement that apprentices undertake a rigorous review of performance against the competences in the standard in the last month before they plan to take the end-point test. This will enable the apprentice and their employer to judge whether they are confident that they have taken on board all aspects of the occupation. This self-assessment can be used as a source of evidence to prepare for the professional dialogue.

It is also recommended that the apprentice and their employer review all aspects of the apprenticeship prior to submitting an application for an end-point assessment. The employer will recommend an apprentice for end-point assessment and it will be their judgement as to whether the apprentice is ready for the end-point assessment. The employer may wish to include evidence from their learning provider to determine the apprentice's preparedness.

End Point – Assessment What is being assessed?

Assessment Method	Area Assessed	Assessed by	Grading	Weighting

Knowledge test	<p>Core Knowledge 60% of the component (36 Questions)</p> <p>Safety critical items such as isolation of mains electricity and the identification and testing of a viable loop circuit will be questioned throughout the entire assessment process.</p> <p>Health and safety - health and safety legislation, codes of practice, relevant regulations (for example CDM) and safe working practices. Electricity at work regulations, handling of situations and materials (6 Questions)</p> <p>Core systems - fundamental design criteria, installation, commissioning, handover and maintenance of fire, emergency lighting, security systems and components. Types of units, cabling and electrical resistance will be assessed. (6 Questions)</p> <p>Electrical and electronic principles - installation and testing techniques for electrical and electronic components, equipment and control systems for fire, emergency and security systems. There will be an emphasis on testing and commissioning as well as connection to control panels, British Standards such as BS7671 (5 Questions)</p> <p>Practices and procedures - fundamental principles and quality processes associated with industry and or company codes of practices. Use of risk assessment method statements (RAMS), British Standards associated with what is being fitted, relevant quality manual, sign off for design and commissioning and understanding certification (5 Questions)</p> <p>System technologies - how to store, retrieve, manipulate, transmit or receive data and or information electronically in a digital form across a range of ICT applications (for example personal computers, digital transmission over IP, email, mobile communication technology). (5 Questions)</p> <p>Communication - different communication styles, how to communicate in a clear, articulate and appropriate manner and how to adapt communication style to suit different situations. (4 Questions)</p> <p>Commercial awareness - commercial risks and responsibilities. Managing time, resource and job planning for economy, business and client convenience and sound business principles (2 Questions)</p> <p>Customer service - principles of high quality customer service and the needs of others. Building and maintaining relationships, managing conflict and dispute and offering sound and mutually productive information, advice and guidance. (2 Questions)</p> <p>Environmental principles - compliance to environmental legislation and the impact of processes and technologies associated with fire,</p>	EPAO	(Fail) Pass Distinction	20%
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<p>emergency and security systems. Questions to assess the apprentice on the culture of re-use and recycle, WEEE Regulations (waste electrical electronic equipment) and the dangers of asbestos (1 Question)</p> <p>Options Knowledge 40% of the component (24 Questions) The knowledge questions for each pathway will be structured using the following template:</p> <p>Design criteria (the design of a system) The plan for design and installation Risk assessment method statement (RAMS) Installation issues and procedures Commissioning a system Handover of a system Maintenance of a new or existing system, including periodic, fault diagnosis, network outages or faults and system age-related maintenance.</p> <p>Fire Understand the relationship of fire detection and alarms to the fire industry, the principles and features for design criteria and the methods of surveying new and existing systems. The Planning and project management for system installation, commissioning and handover (including zone charts). Installation will include questions on wireless technology, alarm transmission systems and aspirating systems. The preventative and corrective maintenance of fire detection and alarm systems, emergency systems and components.</p> <p>Security Understand the requirement and implementation of security risk assessments, the principles, functions and operation for design criteria. The planning and project management for system installation, commissioning and handover. The preventative and corrective maintenance of intruder and hold up alarms will always be assessed in the knowledge test. Additionally, access control, video surveillance (CCTV) and other electronic security systems and components will be assessed.</p> <p>Fire and emergency lighting Understand the relationship of fire detection and alarms to the fire industry, the principles and features for design criteria, and the methods of surveying new and existing systems. The Planning and project management for system installation, commissioning and handover. The preventative and corrective maintenance of fire detection and alarm systems, emergency lighting, emergency systems and components. The installation of electrical circuits, selecting correct protective devices, testing and certifying to current standards.</p> <p>Fire and Security (Both themes have equal weighting throughout) Understand: the relationship of fire detection and security alarms</p>			
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	<p>to the fire and security industry and the requirement and implementation of security risk assessments, the principles, features, functions and operation for design criteria, and the methods of surveying new and existing systems. The Planning and project management for systems installation, commissioning and handover. The preventative and corrective maintenance of fire detection and alarm systems, emergency systems and components, intruder and hold up alarms, access control, video surveillance (CCTV) and other electronic security systems and components.</p>			
<p>Practical skills test</p>	<p>Candidates will attend an assessment centre, under the supervision and approval of an EPAO, to undertake a standardised skills test in controlled conditions. The skills test must be undertaken in an approved test centre to be considered a valid end-point assessment activity. The skills test will assess the core elements of the standard as well as the candidate’s chosen option.</p> <p>Core Skills Test (60% of this component)</p> <p>Working safely Operate in a safe working manner by adhering to health and safety legislation, codes of practice and applying safe working practices.</p> <p>Core systems techniques</p> <p>Contribute to the application of design, planning, installation, testing, commissioning, maintenance, fault diagnosis, service and repair and electrical and electronic techniques on fire, emergency and security systems.</p> <p>System technologies Operate a range of ICT equipment and systems to store, retrieve, manipulate, transmit or receive digital data and electronic information in applications and environments applicable to the role.</p> <p>Supervisory Take responsibility for own work and safety and welfare of others. Oversee and organise the programme of work and work environment. Carry out work and manage resources in an environmentally friendly manner.</p>	<p>EPAO</p>	<p>(Fail) Pass Distinction</p>	<p>60%</p>

	<p>Skills Test for each option (40% of this component)</p> <p>The apprentice's chosen option will be assessed at the same time and the skills to be tested will include:</p> <p>Fire (ANNEX A) Apply and implement system design, planning, installation, testing, commissioning and handover. Carry out preventative and corrective maintenance, diagnosis and repair faults, of fire detection and alarm and other emergency systems and components</p> <p>Security (ANNEX B) Apply and implement system design, planning, installation, testing, commissioning and handover. Carry out preventative and corrective maintenance, diagnosis and repair faults, of intruder and holdup alarms, access control, video surveillance (CCTV) and other electronic security systems and components</p> <p>Fire and emergency lighting (ANNEX C) Apply and implement system design, planning, installation where required, testing, commissioning and handover. Carry out preventative and corrective maintenance, diagnosis and repair faults, of fire detection and alarm, emergency light systems and other emergency systems and components.</p> <p>Fire and Security (ANNEX D) Apply and implement system design, planning, installation, testing, commissioning and handover. Carry out preventative and corrective maintenance, diagnosis and repair faults, of fire detection and alarm, and other emergency systems and components, intruder and holdup alarms, access control, video surveillance (CCTV) and other electronic security systems and components.</p> <p>Due to the regulated nature of the industry, each option pathway has an associated detailed skills test brief. Detailed Skills Test contents are found in the Employer Occupational Brief.</p>			
Professional discussion	<p><i>All 'applied' knowledge and behaviours will be assessed in this component using a wide range of evidence sources including scenario based questioning and the candidate self-assessment</i></p> <p>Behaviours tested in the Professional dialogue</p> <p>Honesty and integrity Dependable and responsible Positive can-do attitude Openness to learning Maintain continuous professional development. Work with others Safe and sustainable working</p> <p>The professional dialogue will be undertaken at the skills assessment centre and will draw from the core elements of the standard as well as the chosen option.</p>	EPAO	(Fail) Pass Distinction	20%

How will assessment be undertaken?

Knowledge test (90 minutes maximum time allowed)

The knowledge test is designed to test underpinning knowledge required to demonstrate competence in the workplace and will be in the form of multiple-choice questions (60 Questions in total). The assessment will be undertaken online, under controlled conditions at the assessment centre with a time limit applied. Questions will be drawn from the stated knowledge elements of the standard and focus on the higher order competencies. Material may be drawn from any part of the apprenticeship standard, with question numbers set according to the proportions detailed in this assessment plan. There will be a common core set of questions for all apprentices within this assessment as well as questions from the apprentice’s chosen option.

The grading threshold will be:

Unacceptable achievement (Fail)	0-39 correct answers
Acceptable achievement (Pass)	40 correct answers
Outstanding achievement (Distinction)	50 or more correct answers

Candidates achieving between 25 and 39 correct answers may automatically re-sit the assessment within three months. Candidates achieving less than 25 correct answers, or those unsuccessful in a re-sit test, will not be allowed to re-take the assignment until after completing a professional review of performance with their employer, after feedback from the independent assessor.

Practical Skills Assessment (taken over two days as below)

Candidates will be required to attend a skills assessment centre to undertake a simulated practical assessment. The assessment will assess a wide range of skills in a safe and highly controlled environment to allow standardised practice, ensuring safety and an opportunity to clearly demonstrate competence. The amount of assessment for all four pathways will be identical. Some options will require the resetting of equipment and the preparation of test areas within the two-day assessment centre.

Each option will have the same two-day length of assessment:

Pathway	Day 1	Day 2
Fire	Core	Fire option
Security	Core	Security option
Fire and emergency lighting	Core + fire	Emergency lighting
Fire and security	Core + fire	Security

The detailed skills to be assessed at the assessment centres are attached as an appendix to this plan.

It must be noted that unsatisfactory performance in either of the two safety critical areas will result in a mandatory fail for the practical assessment and the termination of the assessment. All involved in this apprenticeship must be aware of this requirement. The two areas are: Isolation of mains electricity when undertaking any activity and the identification of, and working with, a viable loop circuit.

Unacceptable Performance	-	Fail
Acceptable achievement	-	Pass
Outstanding achievement	-	Distinction

Professional dialogue (45 minutes)

A professional dialogue will be undertaken with an independent assessor. The interview will be of no more

than 45 minutes' duration. Candidates can only apply to undertake the interview component once the multiple choice assessment has been *achieved*. The interview will draw questions and amplifications from the candidate's written self-assessment and other reference material, supervisor, line-manager and other workplace evidence, service user testimony, the candidate's self-assessment and a sample of standardised candidate questions (given to every apprentice candidate) posed in the interview itself. The professional dialogue will also include a set of scenario-based questions to test the candidate's ability to link knowledge, skills and behaviours.

Unacceptable Performance	-	Fail
Acceptable achievement	-	Pass
Outstanding achievement	-	Distinction

Assessments will take place in assessment centres run by the EPAO, who will develop the specific criteria for grading. The professional dialogue must take place at the assessment centre under controlled conditions, but can include evidence from the employer of the apprentice.

Fail grades and other unacceptable achievement

Some elements of the assessment will be regarded as *safety-critical*. Failure to meet the required standard in those areas identified as safety critical will result in an immediate failure of the component. Safety critical elements will be identified during on-programme training and assessment, and will include areas such as electrical isolation, aspects of Health and Safety and compliance with legally enforced regulations. A re-take will only be eligible for further funding if additional learning has been undertaken and in compliance with current funding rules that may apply.

Candidates receiving a failure in these safety-critical circumstances will need to have a review of performance before being allowed to re-take the end-point assessment.

Candidates receiving a Fail grade in any other circumstances will be allowed to re-sit the end-point assessment. They will undertake a different assessment series to maintain fairness and standardisation of assessments. Any candidate re-sitting or re-taking any assessment can still achieve Pass and Distinction grades for any components retaken.

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.

Marginal (non-Fail) failures in non-safety critical aspects during practical assessments are permitted as long as the assessor is otherwise satisfied that the apprentice is competent and works safely to an acceptable standard. Such failures therefore do not automatically result in a Fail grade. The assessor can explore the issues further during the professional dialogue.

Who will undertake the end-point assessment?

End-point assessments will be carried out by assessors from end-point assessment organisations on the apprenticeship providers and assessment register (APAR).

The criteria for the award of an apprenticeship – The final judgement

Although employers may be involved in providing evidence for the professional dialogue, the final decision on whether the apprentice has passed the end-point assessment and the grade achieved, lies solely with the independent assessor who will grade the apprenticeship according to the components set out in this plan.

Independence

End point assessments will be conducted by an independent assessor from an approved EPAO on the APAR.

An Apprenticeship certificate will only be issued and validated if approved by one of the approved independent assessors. All other assessment will be considered as formative and on-programme.

End-point – Summary of roles and responsibilities

Assessor	Role
Employer	To agree a candidates preparedness for the interview and to participate in the professional dialogue. They will not have a role in final grading of the apprenticeship.
Training Provider	To advise the employer on whether the apprentice is ready to undertake the end-point test through review of the gateway steps such as service user testimony and self-assessment.
EPAO	To devise and administer the end-point situational judgement test and run assessment centres for such tests and professional dialogues.

Quality Assurance – internal

Internal quality assurance will be undertaken. EPAOs who will be expected to regularly compare judgements and grading decisions offered by their assessors for consistency.

Quality Assurance – external

Ofqual will be the EQA provider for this standard.

Professional Body

Apprentices achieving the end-point assessment will be able to apply for registration with a relevant Professional body. Assessments are being closely linked to the quality criteria of the IET to enable applications for registration on completion of the apprenticeship.

End-point - Grading

A candidate will be required to complete and achieve a minimum of a Pass in all three of the end-point assessment components as above in addition to achieving the pre-requisite gateway components to allow the end-point assessment to be attempted. The grade for each component will appear on the achievement certificate. The grading thresholds are summarised as:

A **pass** is awarded where all components are a minimum of a pass

A **distinction** is awarded where the knowledge Test (50 correct answers or more) and the practical skills test is a distinction

Other combinations will achieve a **pass** overall.

The EPAO will set the criteria for the award of a Pass and Distinction and will compose the multiple-choice assessment to meet the intended grading thresholds.

Weighting

There are two types of weighting applied to this assessment plan.

1. The three components are weighted in order to generate a final assessment grade for the whole apprenticeship

2. Each component is divided into a core (60%) and an option (40%). Therefore, each assessment is composed of two parts. The combined score is weighted to give a component score.

Implementation

There are currently over 500 achievements of apprentices in this occupation and this volume is expected to continue and grow. The likely costs will include the establishment of an assessment centre network and in creating the range of knowledge test questions, the setting up of practical assessment scenarios and the overall quality assurance reporting process. Consistency of delivery will be achieved through the employer-led process of review through convening standardisation conferences of the different end-point assessment organisations and reviewing the central database of knowledge questions, skills assessments and professional dialogue questions. Results and achievements may also be monitored so that quality can be reviewed nationally and risk-based audits can take place where necessary. The existing college and / or delivery network via an awarding organisation is expected to be an established electrical biased training centre and / or company in order to maximize the current delivery and training skills needed.