Unit:

Unit: Level 2 Foundation in Fire Detection and Alarm Date Completed: 17 Aug ’17

Development Group: FD&A Development Group Reviewed 22 Jan 2020

Guided Learning Hours (GLH) 16 Directed Learning (DL) 1 Invigilated Assessment Hours (IA) 1.10 Total Qualification Time (TQT) 18.10

Assessment Method: Multi Choice and Short Answer

Learning Outcomes: this is the foundation course to the Fire Detection and Alarm (FD&A) suite of qualifications. Learners will be required to achieve a pass in this unit, before going on to complete the advanced FD&A units;

- Level 3 Fire Detection and Alarm Advanced Designer
- Level 3 Fire Detection and Alarm Advanced Installer
- Level 3 Fire Detection and Alarm Advanced Commissioner
- Level 3 Fire Detection and Alarm Advanced Maintainer

As a pre-requisite for other units (listed above) this unit requires successful completion first, prior to completing the advanced units. A successful pass needs to be recorded once only before accessing other units. It is not required that this unit be completed on each occasion, unless such changes have been made to this unit in the interim period between successful completion and registration on an advanced unit. Centres will be informed if such a level of review and update has been made.

Learners completing this unit will have gained foundation level knowledge and understanding of the legislative requirements, codes of practice and guidance for FD&A systems. They will also gain foundation knowledge and understanding of working in the FD&A sector common to all of the advanced units including; Working with Third Parties, Documentation, Fire Event, Passive Systems, FD&A Technology, Simple Design Principles, False Alarms and Unwanted Fire Signals.

This unit does not provide a qualification for technicians/engineers to work in any associated specialised field in its own right and must be completed as part of a suite of units fulfilling the requirements of a published qualification.

Subject	Knowledge Criteria	Performance Criteria
A. Legislation:	Learners will have knowledge and understanding of: 1. Current UK Fire Law a. UK Fire law according to the relevant UK country in which they are working b. Variations to fire legislation across UK National boundaries c. Personal responsibilities, as prescribed by current legislation, relevant to their region 2. EU Directives pertaining to Fire Law and Fire Safety Products with specific reference to: a. Directive 2014/34/EU (ATEX) b. Directive 2014/35/EC (LVD) c. Directive 2014/30/EU (EMC) d. Directive 2011/65/EU (RoHS) e. Directive 2012/19/EU (WEEE) 3. The Construction Products Regulation (CPR) a. How CPR relates to products used in fire safety systems and their relationship to other EU Regulations b. Recognised/Approved CE Markings c. The difference between CE Marking and Third-Party Approval, Self-Declaration d. Declarations of Performance e. Use of Non-CE Marked equipment	Learners will be able to: 1. Explain current applicable UK Fire Law according to UK country in which they are working a. List key roles defined in current UK Fire Law and explain the responsibilities defined for each role b. State and explain variations in UK Fire Law between countries other than that in which the learner is based/employed 2. Explain the relationship between EU Directives and UK Fire Law a. Explain the purpose of specific directives, providing a brief explanation of the area covered and the intent of the directive 3. Explain the purpose of the Construction Products Regulation

	Explanatory Notes Compliance with Fire Law is mandatory and ignorance of requirements laid down does not serve as a defence in court. Learners will not only be required to hold knowledge and understanding of Fire Law pertinent to their own country in which they will be working, but also of differences in Fire Law for other countries of the UK. Learners will also be required to demonstrate awareness and understanding of the variations in building regulations between the UK Countries. Legal requirements on fire systems are not restricted solely to specific fire law, but other forms of legislation will also apply, such as EU regulations requiring that equipment be fit for its designed purpose and having been tested as compliant. Knowledge and understanding of other regulations will raise awareness of legal requirements placed for FD&A systems and assist the learner in their prevention of the use of either the wrong or inappropriate equipment and/or practices in the FD&A Systems for which they hold a duty. Learners are to be aware that legislative requirements take precedence over published guidance and third-party requirements such as Insurance.

Subject	Knowledge Criteria	Performance Criteria
B. Standards, Codes of Practice, Guidance and Technical Notes:	Learners will have knowledge and understanding of: 1. Standards, Codes of Practice, Guidance Documents and Technical Notes. a. Definition of a Standard and its purpose b. Definition of a Code of Practice and its purpose c. Definition of a Guidance Document and its purpose d. Definition of a Technical Note and its purpose e. How a Code of Practice, Guidance Document and a Technical Note relate to Fire Law and their use in Fire Safety Systems f. Awareness of different standards outside of the UK g. What Standards, Codes of Practice and Guidance Documents are currently available for FD&A Systems and their purpose 2. British Standard 5839 a. The structure of BS 5839 and the function of the different sections within them (i.e. Normative, Commentary) b. The different parts to the standard and the specific fields covered (e.g. for BS 5839 with particular reference to parts 1, 6, 8 & 9) 3. Categories of system and the fundamental differences between them according to parts 1 and 6 4. Zoning requirements and of the zone plan according to parts 1 and 6	Learners will be able to: 1. Explain in general terms: a. The titles and aims of a range of Standards, Codes of Practice and Guidance Documents related to the FD&A Sector b. A general definition for Standards, Codes of Practice and Guidance documents and their aims c. How Standards, Codes of Practice and Guidance Documents relate to UK Fire Law d. Awareness and understanding of different standards used outside of the UK 2. With specific reference to BS 5839 a. Provide an outline of the structure of standards and the purpose of each element b. Explain the parts included and state the area of system covered 3. Provide a brief explanation of system categories and outline the levels of coverage provided by each 4. State the purpose of zone planning and explain the main requirements for defining a zone 5. State the specific roles defined within the standard and the function carried out accordingly 6. State the certificates required, the purpose of the certificate at each stage and who should complete and issue them

	5. Defined roles (Premises Manager (PM), Competent Person (CP)) and their definitions 6. Requirements for and the need to certificate work carried out (Design certificate, Installation certificate, Commissioning certificate and Modification Certificate, Maintenance certificate) 7. End user documentation (i.e. log book) 8. The use, purpose and recording of agreed variations	7. State the requirements for and purpose of end user documentation 8. Explain the purpose, use and recording requirements for approved variations
	Explanatory Notes Standards, Codes of Practice, Guidance and Technical Documents help to facilitate compliance with Fire Law. Learners will understand where each publication sits in relation to Fire Law, along with their intended purpose and use. With knowledge and understanding of what Standards, Codes of Practice, Guidance Documents (e.g. Healthcare Technical Memorandums) and Technical Notes are and how they are used, learners will focus their knowledge and understanding on BS 5839, with specific reference to the structure of the standard, what each part specifically covers and the generally stated requirements (i.e. general requirements not otherwise covered under technology or simple design principles).	

Subject	Knowledge Criteria	Performance Criteria
C. Working with Third Parties	Learners will have knowledge and understanding of: 1. Agreements/contracts between the client and service providers 2. Third-Party Certification Schemes a. The aims and purpose of Third-Party Certification Schemes b. How they apply to products and services c. Scheme providers and Scheme names d. Key considerations required in order to gain approval for third party certification 3. Insurance requirements and their influence on the fire Detection and Alarm System	Learners will be able to: 1. Demonstrate awareness and understanding of the need for and use of an agreement or contract between a service provider and their client. 2. Provide an explanation of Third-Party certification schemes and the scheme providers a. Provide a summary description of Third-Party certification schemes, their purpose and their aims b. Explain how Third-Party Certification Schemes apply to products and services and be able to explain the stated aims and scope of a certificate c. List the main providers of Third-Party Certification Schemes for the FD&A Sector and the scheme numbers d. Explain the difference between modular certification and all-inclusive and give examples of the relative benefits to each e. Explain key considerations in order to gain approval 3. Describe the potential effect that requirements set by insurers can have on an FD&A System

	Explanatory Notes Throughout their lifetime FD&A Systems will not only involve the Premises Management/Responsible Person, but also various other operators and specialist persons, to ensure they are fit for purpose and functioning according to their specified roles. It is important to be aware of the contractual obligations between all parties involved. Whether that be additional or specific requirements laid down for insurance purposes or enforcement bodies, or ensuring that service providers have the necessary and relevant demonstrable competence, in order to carry out the work.

Subject	Knowledge Criteria	Performance Criteria
D. Documentation	Learners will have knowledge and understanding of: 1. Documentation required for an FD&A System a. Regulation 38 b. Fire Strategy c. Evacuation Strategy d. Fire Risk Assessment e. Zone Plan f. System Drawings (design plan, as fitted and as wired drawings) g. System Certificates (Design, Installation, Commissioning, Modification, Acceptance, Verification, Inspection and Servicing and third-party system certificates) h. Log Book(s) i. Manuals 2. Documentation for which the Responsible Person/Premises Manager is responsible a. The Log Book b. Fire Risk Assessment c. Zone Plans d. Certificates e. System drawings (as fitted/as wired diagrams)	The Learner will be able to: 1. List the documents required for the fire safety systems of a building a. Provide a brief overview of the purpose of each document b. State the person(s) responsible for producing and maintaining each document c. Provide an overview of the purpose of the Fire Risk Assessment, who is responsible for its production and upkeep d. State and provide an outline description of the 5 steps to a Fire Risk Assessment, as published in the government guides e. Provide a brief overview of the purpose of a Zone Plan, where it should be displayed and responsibility for its production and upkeep f. Provide a brief overview of the purpose of and responsibility for system drawings and provide example drawings for each g. Provide a brief overview of the purpose and the responsibility for System Certificates h. Provide a brief overview of the purpose of third-party certification for an FD&A System i. Provide an overview of the purpose of a log book, the information that should be included within it and who is responsible for its upkeep j. Provide an overview of system manuals, their purpose and the responsibilities for their production and maintenance

		2. Explain the responsibilities of the Responsible Person/Premises Management for system documentation
	Explanatory Notes Understanding the documentation required and the responsibilities for their retention and upkeep will help learners to assist customers in complying with their legal requirements. Awareness of all documents included as part of a fire safety file for the building will be supplemented with deeper levels of knowledge and understanding of documents most applicable to the FD&A technician. For learners returning to complete the advanced specialist units, understanding the requirements and responsibilities for documentation will serve as a prerequisite in their preparation for final assessment	

Subject	Knowledge Criteria	Performance Criteria
E. Fire Event	Learners will have knowledge and understanding of: 1. The basic scientific principles of fire including: a. The Fire Triangle and Pyrolysis b. Flammable materials and sources of ignition c. Extinguishing methodology d. Fire Spread, Flashover and Backdraught e. Fire Stopping and Compartmentation 2. Procedures in order to confirm a fire event a. Alarm Confirmation b. Coincidence, Double knock automatic alarm c. Visual Confirmation 3. Policies and procedures in the event of a fire. a. Pre-Alarm b. Stay put policy c. Phased evacuation d. Disability and equalities legislation applicable according to UK Country where the learner will be employed (evacuation of persons with mobility difficulties, Refuges, Assistive equipment) e. Fire Marshals f. Fire safety and building security	Learners will be able to: 1. Provide an explanation of the science of fire and extinguishing a. Explain the fire triangle and the process of pyrolysis b. List the different types of flammable material providing examples of each c. Explain the basic principles of extinguishing and how selected extinguishing media work (Starvation, Asphyxiation, Cooling) d. Explain the stages of fire spread with an overview of Conduction, Convection, Radiation, Flashover and backdraught e. Explain the importance of speed in detecting fire in relation to life and property f. Explain the principles of fire stopping and compartmentation 2. Explain why it may be necessary to carry out fire confirmation and the common processes used a. Explain the relative benefits and pitfalls of automated confirmation of a fire versus manual confirmation (i.e. confirmation through automated fire detection against human investigation/confirmation) 3. Explain the purpose and principles of different fire strategies, giving basic examples of where they may be necessary and the limitations to use

		a. Provide examples and a brief explanation of what measures may be necessary to aid the evacuation of persons with limited mobility b. Explain the purpose of a fire marshal c. Explain the implications and risks to both fire safety and to building security in the event of a fire
	Explanatory Notes Knowledge of fire science and strategies for handling a fire incident provides a comprehensive background understanding of the need for and influence of an FD&A System. Enabling the learner to clearly explain how the installation of an FD&A system will assist and contribute to the overall fire safety of a building. Learners will also be able to explain basic requirements for fire safety of persons covered by disability legislation pertaining to UK country in which they will be working. This will include any legal requirements for compliance with prevailing legislation the equipment available to assist in raising alarm and for safe evacuation. Learners will also demonstrate understanding on building security and provisions for enabling safe evacuation where security is of concern (e.g. BS 7273-4)	

Subject	Knowledge Criteria	Performance Criteria
F. Passive Fire Protection	Learners will have knowledge and understanding of: 1. Common structural materials, their reaction to fire and their fire-resistant properties 2. Processes and materials that may be used to increase fire resistance a. Covering materials b. Intumescent coatings and seals 3. The implications to fire safety/fire stopping when passive fire protection materials and coatings are damaged or breached a. Penetrations through fire compartmentation and fire rated materials b. Impact damage to fire resistant coatings c. Damage to fire resistant covering	Learners will be able to: 1. Provide a brief explanation of the term 'passive fire protection' and how they affect building structure and materials 2. Be able to state what additional materials/methods can be used to increase fire resistance 3. Explain how fire-resistant properties can be compromised and what should be done to mitigate this
	Explanatory Notes Touching on passive fire protection, learners will develop understanding of the materials used in a building and the implications of any damage that may result. They will develop an appreciation for and understanding of, the implications of penetrations through fire compartmentation, along with an appreciation of the materials and measures available to reinstate fire stopping.	

Subject	Knowledge Criteria	Performance Criteria
G. FD&A Systems Technology	Learners will have knowledge and understanding of: 1. The technologies available within the FD&A sector, including current, emerging and legacy technology still found in the field. This will include but is not limited to: a. Self-contained/combined devices b. Detection Technology i. Point type detectors ii. Linear cable iii. Beam detectors iv. Aspirating detection v. Video smoke and flame detection c. Types of Alarm Technology i. Bells ii. Sounders iii. Voice alarm iv. Visual alarm v. Tactile devices d. System Communications i. Hard Wired ii. Wireless e. Communications with Alarm Receiving Centres (ARC) f. Analogue systems i. Open and closed protocol g. Conventional systems i. 2 and 4 wire 2. The relative advantages and disadvantages of each technology against its peers and considerations for best usage	Learners will be able to: 1. Provide a brief explanation of: a. Different types of detection technology available and give a brief description of how they work b. Alarm technologies available and give a brief description of how they work, any restrictions on their usage (i.e. sound Pressure levels, Strobe effect) and the relative benefits of each c. Communication technologies within the FD&A System for both hard wired and wireless systems d. Technologies for communication with the Alarm Receiving Centres (ARC) e. The practice of utilising the security system for communications with ARC and the relative risks and benefits f. Communications within the FD&A system 2. Provide a summary and brief explanation of the relative advantages and disadvantages to using any of the technologies, in comparison to its technological peers (e.g. the beneficial difference between point and linear detectors or addressable and non-addressable)

	Explanatory Notes Understanding the technologies available will enable the learner to identify which technologies suit any particular situation. They will be able to advise what technology will work in the space available and the relative benefits of each.

Subject	Knowledge Criteria	Performance Criteria
H. System Design (requirements as per BS 5839 parts 1 & 6)	Learners will have knowledge and understanding of: 1. System categories and the requirements placed upon system design a. Life protection, categories L1-L5, LD b. Property protection, categories P1-P2, PD c. Manual protection, category M d. Multiple Categories (e.g. L3/P2) e. Dwellings Protection, grades 2. Zones a. Detection Zones b. Alarm Zones 3. Positioning (including awareness of special considerations for voids, ducts and pitched roofs as applicable) a. Detection coverage for point, linear and beam detectors b. Manual Call Points (including a definition of final exit and travel distance) c. Audibility and positioning of audible alarms d. Visibility and positioning of visual alarms e. Control and Indicating Equipment (CIE) 4. Cabling a. Grades of cable (Standard or Enhanced) b. Cable paths c. Cable fixings d. Cable limitations	Learners will be able to: 1. Provide an overview of system categories and their requirements for coverage a. life, property and manual protection categories and considerations to be made when selecting the right category b. Protection grades for dwellings 2. Explain what is meant by the terms Detection Zone and Alarm Zone and how they apply to system design 3. Explain the design considerations for a. correct placement of devices i. Point and linear detectors ii. Audible and visual alarms iii. Manual Call Points b. the additional recommendations that would apply for i. Pitched roofs ii. Voids iii. Ducts 4. State the considerations for cable selection and the requirements for cable fixings, cable paths, type, size and colour 5. State the principle of cause and effect in system design a. State the difference between cause and effect programming and cause and effect through hard wiring, giving relative benefits of each

	5. System cause and effect 6. Awareness of Construction Design Management (CDM) regulations and considerations to be made in system design	6. State what considerations would be given for compliance with CDM regulations and how system design can help compliance 7. Set out very simple design plans against example rooms and/or zones provided
	Explanatory Notes Understanding simple design principles enables the learner to recognise when a design plan or an installed system needs to be referred back to the designer for review It should be noted that the aim of this module is not to empower a learner as a system designer but to recognise where design may need to be amended by a competent designer or where a fitted system may need changes made.	

Subject	Knowledge Criteria	Performance Criteria
I. Explosive Environments	Learners will have awareness of: 1. Explosive environments a. The type of environment that would be considered explosive b. Hazards leading to explosion 2. The measures that should be taken to mitigate the risk of explosion a. Working in an explosive environment b. Equipment and system components available for explosive environments	Learners will be able to: 1. Recognise a. Classification, types and nature of explosive environments b. Hazards when working in an explosive environment 2. Provide a brief explanation of measures that may be made to reduce or mitigate risk a. Changes to the environment b. Provisions for equipment and system devices for explosive environments
	Explanatory Notes Having an awareness of explosive environments and the risks associated with them is a key to life safety when progressing to more advanced units. Awareness of explosive environments at this stage adds an awareness of special considerations for FD&A systems at all stages of the system life. This subject is not intended to develop competency to work in or design systems for explosive environments, further training will be required for technicians intending to do so.	

Subject	Knowledge Criteria	Performance Criteria
J. False Alarms and Unwanted Fire Signals	Learners will have knowledge and understanding of: 1. False alarms and unwanted fire signals and their management a. Definition of and differences between a false alarm and an unwanted fire signal b. Recording of false alarms and unwanted fire signals c. Investigation 2. Causes of false alarm that may lead to an unwanted fire signal a. Equipment false alarms b. Unwanted alarms c. Malicious false alarms d. False alarms with good intent 3. Management of a system for the reduction of false alarms and unwanted fire signals a. Management/soft measures for the reduction of false alarms b. Physical measures for the reduction of false alarms 4. Steps that may be taken by the Fire and Rescue Services (FRS) to counter the effect of Unwanted Fire Signals 5. Steps that may be taken for the reduction and/or prevention of unwanted fire alarm signals	The learner will be able to: 1. Provide an explanation of: a. False alarms and unwanted fire signals and the difference between them b. Reasons for recording false alarms and the information required c. Principles of investigation and points for consideration in identifying the causes of false alarms 2. Explain the causes of false alarms including: a. Equipment false alarms, their causes and prevention b. Examples of unwanted alarms c. Malicious false alarms d. False alarms with good intent 3. Explain the principles of false alarm management a. Management controls b. Technical controls c. Soak testing 4. Explain the steps that FRS's may currently take in order to counter the effect of Unwanted Fire Signals 5. State suggested actions that reduce or prevent unwanted fire signals

	Explanatory Notes Unwanted fire signals lead to significant cost in terms of lost production for the business, staff time wasted and, in some cases, costs associated with the deployment of the Fire and Rescue Service. Understanding the causes of false alarms and unwanted fire signals and the measures that can be put in place may counter any negative impact to business through disruption or to staff and residents through complacency in the system