



THE INSTITUTION OF FIRE ENGINEERS
FOUNDED 1918 • INCORPORATED 1924

IFE Level 4 Certificate in Fire Service Operations and Incident Command

Qualification Specification

Qualification Number: 603/6614/X

About the Institution of Fire Engineers (IFE)

The IFE is the professional institution for those working in the fire sector. The IFE is a registered charity working for societal benefit. Founded in 1918, the IFE's mission is to promote, encourage and improve the science, practice and professionalism of fire engineering with the overall aim of protecting and saving lives.

Members of the IFE share a commitment to ensuring that the fire profession remains relevant and valued, protecting people, property and the environment from fire.

About the IFE Awarding Organisation

The IFE's awarding organisation is non-profitmaking.

The aim of the of the awarding organisation is to encourage those who work in the sector to engage with, and develop, the critical understanding needed to operate effectively and safely and to best professional standards so that they can protect and save lives. In doing this, the awarding organisation contributes to three of the IFE's (six) over-arching strategic priorities ie:

- Facilitate awareness of fire issues and developments through the communication of ideas, knowledge, information
- Foster professionalism by establishing and maintaining pathways and recognised standards of fire professionalism and competency.
- Increase knowledge in the science, practice and professionalism of fire engineering.

All of the IFE's qualifications are designed for those working in the fire sector and to meet the above aims. Qualifications and their associated assessments (examinations and practical activities/assignments) provided by the IFE are designed, assessed and quality assured by experts with extensive experience of working within the fire sector.

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IFE Level 4 Certificate in Fire Service Operation and Incident Command

Introduction

The IFE Level 4 Certificate in Fire Service Operation and Incident Command has been developed by the Institution of Fire Engineers (IFE) and representatives of the UK Fire and Rescue services. The content and structure of the qualification reflects the content and structure of the National Operational Guidance (NOG) and is designed to support those operating in the fire service in dealing with incidents effectively and safely.

This qualification focuses on the strategies and activities required to assess and resolve fire and rescue incidents in diverse, complex and escalating situations. It reflects the breadth of knowledge and understanding required by an Incident Commander operating at tactical level. It covers incident management as well as technical expertise and post-incident de-briefs and reviews. Candidates will be required to apply detailed and technical understanding by assessing situations, determining hazards and risks and drawing conclusions as to the appropriate actions and control measures for the specific situation. They will need to be able to explain the rationale for decisions and to draw on technical understanding specific to the context.

This qualification is derived from unit 3: Fire Services Operations and Incident Command within the Level 4 Certificate in Fire Science and Fire Safety. It is directly equivalent to that unit in that the content and assessment remain exactly the same. Individuals who achieve this qualification may use it towards the achievement of the Level 4 Diploma in Fire Science and Fire Safety in the same way as unit 3 is used. For information, please see - <https://www.ife.org.uk/IFE-Qualifications-with-Syllabus-Links>

Target Audience

This qualification will be appropriate for individuals working in fire and rescue roles. It is particularly suited for those who either hold, or are preparing for, roles such as Station Manager or Area/Regional Manager.

Learning Outcomes

Candidates who achieve this unit should be able to:

- assess incidents and determine appropriate strategies to resolve them
- understand the issues to be taken into account in evaluating and determining incident status, assuming responsibility and taking over command and control operations
- understand how to deploy firefighting equipment and other resources
- understand how to preserve the safety of firefighters and members of the public
- understand how to work with partners and multi-agency groups at complex incidents
- evaluate and develop policies and procedures relevant to the management of fire and rescue incidents

Qualification Content

The content of the qualification is set out in the section entitled “Content” below. This section provides information on the range of topics that must be studied including the way that candidates need to show their understanding (ie the Assessment Objectives) and the scope/range/contexts in which they can be tested (Knowledge, Understanding and Skills).

The syllabus content is very broad and deep and therefore not all topics can be tested in all examinations. Candidates are advised to prepare for the examination by covering all topics so that they are able to provide comprehensive responses.

Assessment

The assessment takes the form of one three-hour examination. The examination is closed-book and provides a summative assessment of the full range of learning specified in the content below.

Candidates will be required to complete **six** questions from a choice of **eight** questions. There will be 20 marks available for each of the questions.

In order to achieve a pass, candidates will be required to attain at least 40% of the 120 marks available to them via the six questions (ie 48 marks).

Candidates who answer fewer than six questions will be able to achieve a pass as long as they achieve the minimum pass mark of 48. Where candidates answer more than six questions, candidates will not benefit as only the six best responses will be included in the final total mark.

Past papers for the last three years are available on the IFE website - <https://www.ife.org.uk/Qualifications/Past-Papers-and-Exam-Reports> Please see the papers (and associated examiner reports) for March and October examinations for the L4C3 Fire Service Operations and Incident Command unit (in the section for the Level 4 Certificate in Fire Science and Fire Safety).

Examinations are provided in English only.

Grading and Certification

Results of examinations will be reported as follows:

Pass - this is awarded where candidates achieve a mark between the minimum pass mark of 48 marks (ie 40% of the marks available) and 71 marks (59%).

Distinction - this is awarded where candidates achieve a mark of 72 or above (ie 60% or more of the marks available).

Fail - candidates who achieve 47 marks or fewer will receive a result showing Fail. Where candidates receive 24 marks (ie 20% of the marks available) or fewer, the result will show Fail (X).

Candidates who are unsuccessful in the examination may re-sit the examination. There is no limit on the number of times that candidates may re-sit.

Note: The IFE reports results as described in the bands above. However, candidates who wish to know the specific mark awarded to them may email the IFE for this information.

Entry Requirements

There are no formal entry requirements.

However, the wide range of contexts and complex situations covered in the content means that candidates will benefit from previous study at Level 3 as this will provide a foundation of knowledge and understanding.

As the paper is provided in English only, candidates will need to be able to read English fluently in order to access the examination questions and the relevant recommended reading material.

Qualification Level

This qualification has been designed to enable candidates to demonstrate that they have attained skills and knowledge at Level 4. Other types of qualifications that are set at Level 4 include Certificate of Higher Education (CertHE), Higher National Certificate (HNC) and Level 4 NVQs.

The qualifications regulator, Ofqual, has provided the following descriptors to illustrate the knowledge and understanding expected from those who hold qualifications at Level 4.

Level 4 Knowledge descriptor

The candidate:

- Has practical, theoretical or technical knowledge and understanding of a subject or field of work to address problems that are well defined but complex and non-routine.
- Can analyse, interpret and evaluate relevant information and ideas.

- Is aware of the nature of approximate scope of the area of study or work.
- Has an informed awareness of different perspectives or approaches within the area of study or work.

Candidates are advised to bear these descriptors in mind when preparing for assessment and when presenting responses to examination questions.

Qualification Learning Time

The length of time needed to prepare for this examination will vary depending upon the starting point for each individual.

Total qualification time is 200 hours:

- 197 hours of learning/study. Study may be self-study (please see the section on recommended reading material below) and may include relevant CPD and fire and rescue service training programmes.
- 3 hours of assessment (directed time) ie one three-hour examination.

Most candidates prepare for IFE examinations via self-study or by drawing on training provided by their employer that covers aspects of the syllabus. Candidates are advised to cross-map their study/training against the content of the syllabus to ensure that all part of the syllabus have been covered. Recommended reading materials are provided below.

Progression

Candidates who are successful in achieving this qualification may consider progression to specialist degree or Foundation Degree programmes.

Candidates who wish to broaden their knowledge and understanding at Level 4 could consider working towards other fire-specific qualifications such as the IFE Level 4 Certificate in Fire Safety or the IFE Level 4 Certificate in Fire Engineering Science.

Reasonable Adjustments

The IFE permits reasonable adjustments to be made where candidates have disabilities (including medical conditions and learning disabilities such as Dyslexia). The IFE's policy on reasonable adjustments aims to enable candidates with disabilities and other difficulties to access the IFE qualifications without compromising the assessment process or the validity of the certificate.

The policy, which includes the types of arrangements that may be made (eg additional time, use of technology) and the procedure for applying for reasonable adjustments, is published on the IFE's website - <https://www.ife.org.uk/Qualification-FAQs>. The IFE will consider all requests for reasonable adjustments. All requests for reasonable adjustments must be submitted to the IFE as all decisions on reasonable adjustments rest with the IFE.

Booking Examinations and Additional Information on Examination Arrangements

This examination is available in March and in October each year.

Individuals who wish to sit examinations may book examinations either through their examination centre (eg Fire and Rescue Service, IFE Branch) or they may book through the IFE. Where appropriate, the IFE will direct individuals to approach their FRS, branch contact or examination venue.

Information on the examination timetable and other relevant dates (such as the last date for booking examinations) for March examinations, together with the booking form, the list of venues available to candidates, the terms and conditions for candidates and additional information on examination arrangements is provided on the IFE website on 1 September each year. A separate page for each March examination session is provided on the IFE website. Information on March 2021 examinations is available at: <https://www.ife.org.uk/March-2021-Examinations>

Information on the examination timetable and other relevant dates (such as the last date for booking examinations) for October examinations, together with the booking form, the list of venues available to candidates, the terms and conditions for candidates and additional information on examination arrangements is provided on the IFE website on 1 May each year. A separate page for each October examination session is provided on the IFE website.

Detailed guidance for candidates on examination arrangements is provided in the *Rules and Information for Candidates* booklet. This booklet sets out the rules to be followed by candidates and also the dates for publication of results and the timetable for candidates to query examination results.

Complaints and Appeals

Procedures for making a complaint or lodging an appeal are available on the IFE website - <https://www.ife.org.uk/Qualification-FAQs>

Information for Examination Centres

Organisations that would like to provide a venue for IFE examinations, should contact the IFE to discuss the requirements for centres – please email exams@ife.org.uk in the first instance.

Centres will need to comply with the Terms and Conditions for centres. Information for centres, including the Examination Centre Handbook which contains detailed guidance on running a centre, is available on the IFE website. Please see - <https://www.ife.org.uk/Information-for-Examination-Centres>. Centres are required to re-confirm their compliance with the Terms and Conditions prior to each examination session and to provide an Examination Centre Invigilation Report following the completion of examinations.

The IFE operates a centre inspection programme based on unannounced visits. All centres should anticipate visits from centre inspectors.

Recommended Reading

This qualification covers an extensive range of contexts and candidates are advised to reflect this in their examination preparation. The main source of information is the National Operational Guidance and the supporting scenario and Foundation documents. All of this material is available, free of charge, at <https://www.ukfrs.com/nog>

Candidates are also advised to review past examination papers. Past papers, together with the associated examiner reports on the papers, can be downloaded, free of charge, from the IFE website - <https://www.ife.org.uk/Qualifications/Past-Papers-and-Exam-Reports>.

The IFE has applied the following criteria in determining which resources should be included on this recommended reading list:

- the resource provides information which will be of benefit to the candidate in their professional life, providing depth and breadth of understanding;
- the resource contains some information that will be relevant to part of the syllabus;
- the resource is recognised by industry professionals as providing valuable information.

Candidates preparing for the examinations are advised to refer to the list below:

National Operational Guidance (NOG) - <https://www.ukfrs.com/nog>

All Incident National Operational Guidance:

- Operations
- Incident Command
- Environmental Protection

Contexts National Operational Guidance:

- Industry
- Subsurface, height, structures and confined spaces
- Transport
- Utilities and Fuel
- Major Incidents

Activities National Operational Guidance

- Fires and Firefighting
- Performing Rescues
- Hazardous Materials
- Hazardous Materials – Health Hazards
- Hazardous Materials – Physical Hazards
- Wildfires
- Fires in Buildings

- Fires in Buildings under construction or demolition
- Fires in Waste Sites
- Fires on Board Vessels
- Incidents involving Animals
- Water Rescue and Flooding

Knowledge and Foundation Materials - <https://www.ukfrs.com/guidance/knowledge-base?page=1>

- The Foundation for Incident Command
- Foundation for Breathing Apparatus
- Fires in buildings – building research establishment supplementary information
- Tunnels and underground structures supplementary material
- Utilities and fuel supplementary information
- The Foundation for Hazardous Materials
- Firefighting equipment knowledge sheets
- Industry supplementary information
- Smart motorways national operating agreement
- Joint Doctrine of Interoperability working (https://www.jesip.org.uk/uploads/media/pdf/Joint%20Doctrine/JESIP_Joint_Doctrine_Document.pdf)

Scenarios - <https://www.ukfrs.com/scenarios>

- All incident actions
- Commercial or residential building fire
- Industrial or agricultural building fire
- Domestic dwelling fire
- Fires in tall buildings
- Building under construction or demolition
- Fire in a waste site
- Wildfire
- Fire in electrical installation
- Aircraft fire
- Fire on board a vessel
- Railway or tram fire
- Road vehicle fire
- Rescue from water
- Rescue from depth
- Rescue from height
- Rescue of trapped person
- Rescue from collapsed structure
- Rescue involving animals
- Road traffic collision
- Aircraft rescue
- Railway or tram rescue

- Explosives and cylinders
- Flammables
- Health hazards
- Environmental protection

Further Information

Further information on examination conditions is available in the IFE booklet, *Rules and Information for Candidates Taking IFE Examinations*. This booklet can be downloaded from the IFE's website.

Candidates may also find the general guide for candidates which provides information on question times and levels helpful - https://www.ife.org.uk/write/MediaUploads/Exams/Candidate_Guide.pdf

Please address any queries to the IFE by emailing: exams@ife.org.uk

Content - Fire Service Operations and Incident Command

1. Pre-planning

Assessment Objective	Knowledge, Understanding and Skills
<p>1.1 Explain the purpose of pre-planning and inter-agency liaison for all emergency incidents and assess the pre-planning requirements for any specified emergency</p>	<ul style="list-style-type: none"> • Incidents to include: <ul style="list-style-type: none"> ○ All fire situations ○ All Rescue situations ○ Major incidents and incidents involving civil disturbance ○ Acts of terrorism and natural disaster ○ Incidents involving hazardous materials • Information gathering on risks and data capture from predictive modelling such as weather forecasts, tides and seasonal risks in forestry areas, etc. • The safety of all emergency responders, non-emergency personnel working alongside and members of the public, including bystanders • The mitigation of environmental impact • Calculations with regard resources, equipment and personnel • Liaison with other agencies, key site personnel, responsible persons, government representatives and other external partners/stakeholders • Conformation with legal requirements • Working to meet policy and organisational objectives
<p>1.2 Evaluate training requirements and explain activities to ensure that personnel remain competent in role</p>	<ul style="list-style-type: none"> • Definition of occupational competence • Organisational responsibilities • The planning of training and development and its implementation, to include: <ul style="list-style-type: none"> ○ Training needs analysis ○ Planning and evaluating training activities within the work place ○ Assessing strategic performance in line with organisational targets ○ The involvement of multi-agency, partners and stakeholders in strategic planning • Controlling risk, to include: <ul style="list-style-type: none"> ○ Suitability of training venues, use of equipment, personal protective equipment and emergency arrangements ○ Management of training and development events and activities

2. Incident Command and Management

Assessment Objective	Knowledge, Understanding and Skills
2.1 Explain the purpose and scope of key roles within a command structure and assess the level of responsibility and limits to authority	<ul style="list-style-type: none"> • The role and responsibilities of the Incident Commander at Tactical/Strategic level and limits to authority • The performance criteria involved in leading, monitoring and supporting people to resolve operational incidents • The role and responsibilities of Command Support at Tactical/Strategic level incidents, including the role of Command Support Officer • Liaison and working with multi-agency response, local government and stakeholders at Tactical/Strategic level
2.2 Explain and evaluate the importance of successful leadership and the application of effective decision making during operational incidents	<ul style="list-style-type: none"> • The need for effective decision making • How to select and apply a range of tactics and strategy to resolve different types of operational incidents • The term 'situational awareness' and its relevance to the role of Incident Commander • The key elements of leadership within the role of Incident Commander • Awareness of when to work outside of policy • Operational discretion • Effects of decision making on business continuity, recovery and restoration of normality
2.3 Explain and evaluate the principles of successful risk management at operational incidents	<ul style="list-style-type: none"> • The key points in minimising and controlling risks to operational personnel • The relationship between the analytical risk assessment process and the safe and effective management of risk at operational incidents • How to identify and control risk appetite
2.4 Explain and evaluate the benefits of inter-operability and the contribution of other agencies to the provision of specialist advice and support	<ul style="list-style-type: none"> • The need for effective liaison with other agencies to achieve desired outcomes • The provision of information to other agencies which may assist in their decision making • The benefits of inter-operability in obtaining and acting upon specialist advice and support from other agencies
2.5 Explain and assess the principles of command and control, tactics and strategy necessary to resolve emergency incidents	<ul style="list-style-type: none"> • Objectives of ventilation at fires and the principles involved • Strategy and tactics involved in rescue work and how they are used in practice to accomplish efficient rescues • Procedures for ensuring the safety of both personnel and the public

	<ul style="list-style-type: none"> • The need for evacuation at fires, emergency incidents and major disasters and how this can be achieved • Firefighting procedures and tactics in fires involving hazardous materials including hazmat identification systems and hazard tactical systems • Inter-relationship of logistics operations and technical support at incidents • The implications of establishing a successful media communications strategy at developing incidents • Aims of salvage/damage control operations and the principles and technicalities involved
2.6 Explain how to deploy equipment and other resources to resolve incidents including fires and other emergencies	<ul style="list-style-type: none"> • Different types of firefighting media and equipment and its operational use • Selection and deployment of resources • Capabilities and limitations of personnel, appliances, special appliances and equipment • Use of specialist advisors and teams
2.7 Evaluate the communication systems available both at incidents and remotely	<ul style="list-style-type: none"> • Importance of effective communication in recognising poor or inaccurate information and taking action to rectify • Types and methods of communication available to an Incident Commander • Implications of the need to communicate with multiple agencies at large incidents • Range of mobile data terminals and remote information sources available • Role of Command Support in establishing effective communications at incidents • Requirement to ensure timely and regular briefings that involve relevant agencies and individuals

3. Fire and Rescue Procedures – Tactics and Strategy

Assessment Objective	Knowledge, Understanding and Skills
3.1 Explain and evaluate organisational compliance to relevant national legislation	<ul style="list-style-type: none"> • Personal responsibilities under relevant national legislation • Operational responsibilities under national or government legislation • Legal, moral and financial consequences of non-compliance
3.2 Explain how fire development affects the tactics and strategy employed for extinguishing fires in different contexts	<ul style="list-style-type: none"> • The identification of different types of burning material and the effects on building construction • Interruption to business continuity and implications on infrastructure • Ways in which fires can spread detected and undetected both internally and externally • Principles and application of ventilation • Flashover, backdraught and fire gas explosion

<p>3.3 Identify and explain the tactics and strategy required when dealing with fires that occur in different contexts and explain relevant specialist techniques</p> <p><i>(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)</i></p>	<ul style="list-style-type: none"> • Fires in the built environment, to include fires in: <ul style="list-style-type: none"> ○ buildings under construction and demolition or derelict ○ high rise properties or buildings with atriums, basements and tunnels ○ leisure facilities, camp sites and temporary structures ○ waste sites (including renewable energy facilities) ○ retail and leisure facilities ○ commercial premises and industrial/petrochemical processes ○ hospitals, health care and educational establishments ○ prisons and places of lawful detention ○ places of research and laboratories ○ premises used for the generation, distribution, storage or supply of gas, LPG, electricity, solar panels and other sources of power ○ historical buildings and premises containing valuable artefacts including Heritage buildings, museums and galleries • Fires involving transportation by road, rail, air and waterways, to include: <ul style="list-style-type: none"> ○ modes of transportation, ie vehicles rolling stock, aircraft and vessels ○ infrastructure, such as roads, terminals, stations, docks, marinas, etc • Wildfires, to include: <ul style="list-style-type: none"> ○ rural areas such as forests, heath land, wildland, crops, bush, etc ○ farms, farm buildings, processes and equipment
<p>3.4 Evaluate the benefits of salvage operations and controlled burn strategies</p>	<ul style="list-style-type: none"> • Salvage considerations to prevent avoidable damage and mitigate the effects of fire and firefighting operations • Subsequent effects on business continuity, recovery, community impact and restoration of normality • Environmental, community and business impacts of control burn strategies
<p>3.5 Identify and explain the tactics and strategy along with the methodologies of both general and specialist rescue operations required in different contexts.</p> <p><i>(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)</i></p>	<ul style="list-style-type: none"> • Rescues from the built environment, to include: <ul style="list-style-type: none"> ○ entry into and searching of buildings and collapsed structures ○ release of trapped persons from machinery, lifts, escalators • Rescues from sub-surface and confined spaces, to include: <ul style="list-style-type: none"> ○ entry into and searching of tunnels and shafts ○ vat, silo, sewer, trench, pit, chimney • Rescues from transportation incidents, to include:

	<ul style="list-style-type: none"> ○ extrication of persons from vehicles, trains, aircraft, ships and boats ● Rescues from height, to include: <ul style="list-style-type: none"> ○ working at height or with ropes including: buildings, cranes, shafts, cliffs and other permanent or temporary structures ● Rescues from water and unstable ground to include: <ul style="list-style-type: none"> ○ people, property and vehicles from flood water ○ incidents involving still and fast flowing water ○ incidents involving ice, mud and other free flowing solids ● Large animals and humanitarian rescues ● Rescues from incidents involving hazardous materials, to include: <ul style="list-style-type: none"> ○ Hazmat release by defect, natural occurrence, or human act
3.6 Explain the tactical response and strategic objectives of dealing with terrorist related incidents and civil unrest.	<ul style="list-style-type: none"> ● Incidents involving: <ul style="list-style-type: none"> ○ high level terrorist threats or acts, including release of chemical, biological, radiological, nuclear contamination ○ explosive devices such as Improvised Explosive Devices or suicide bombings ○ marauding firearm attacks ○ low level threats or acts from groups making protestations ● Major incidents and civil disturbances
3.7 Explain and evaluate the health and safety management protocols required and the environmental protection considerations when dealing with operational incidents in different contexts. <i>(Note: further amplification of the range of situations is provided in sections 5 and 6 below.)</i>	<ul style="list-style-type: none"> ● Fires/Rescues in the built environment ● Fires/Rescue involving transportation by road, rail, air and waterways ● Wildfires ● Fires/Rescues involving hazardous materials ● Rescues from sub-surface and confined spaces ● Rescues from height ● Rescues from water and unstable ground ● Large animals and humanitarian rescues ● Environmental conditions and severe weather such as flooding, high winds, and extremes of temperature

4. Post-Incident Action

Assessment Objective	Knowledge, Understanding and Skills
4.1 Explain and evaluate the principles and the value of debriefs, applying these principles to different contexts	<ul style="list-style-type: none"> ● How to conduct post-incident debriefs held at the appropriate level dependant on the type and scale of the incident ● How to facilitate debriefs through open and constructive discussion and review ● How to gather and review all relevant information from internal and external sources

	<ul style="list-style-type: none"> • How to implement remedial measures to improve future practice and performance • How to identify trends and their implications on future practice and performance • The feedback process involved to rectify organisational strategic issues
4.2 Evaluate the effects and consequences of incidents	<ul style="list-style-type: none"> • Indirect socio-economic consequences of fires, other emergency incidents and major disasters • Environmental effect and control measures in relation to fires and emergency incidents • Legal responsibilities and the potential for organisational change • Financial costs and litigation issues • Critical incidents and ongoing emotional/welfare support of employees
4.3 Explain the principles of carrying out investigations along with determining the requirements for scene preservation, the collection of evidence and all post-incident actions	<ul style="list-style-type: none"> • Further investigation to include: <ul style="list-style-type: none"> ○ Fire Investigation ○ Fire Safety Investigation ○ Health and Safety Investigation ○ Criminal Investigation ○ Internal Investigation • Investigative techniques of emergency incidents and major disasters • Collation of factual information and the preparation of documents to present at formal proceedings such as post mortems, public and judicial enquiries • The involvement of external agencies and legal compliance

5. Incidents involving Buildings

Assessment Objective	Knowledge, Understanding and Skills
5.1 Assess how a fire or collapse situation has compromised a building's integrity or stability, determine the hazards present and the implications for firefighting and rescue operations on the incident ground	<ul style="list-style-type: none"> • Building methods to include: <ul style="list-style-type: none"> ○ Framed and unframed buildings ○ Steel and concrete frame ○ Concrete construction methods ○ Composite and Modular construction ○ Portal frame and Glulam construction ○ Claddings and fixing methods ○ Staircases ○ Roofs, ceilings and roof lights ○ Flooring and fixing methods ○ Doors and windows ○ Non load bearing walls and partitions • Elements of structure include: <ul style="list-style-type: none"> ○ Columns and Beams ○ Load bearing and compartment walls ○ Floors and frames ○ Enclosed protected shafts and staircases

5.2 Assess the implications of building facilities in relation to fire spread and firefighting/rescue operations	<ul style="list-style-type: none"> ● Building facilities to include: <ul style="list-style-type: none"> ○ Heating and air conditioning systems ○ Ventilation and smoke handling systems ○ Stairwell and pressurisation systems ○ Lifts and escalators ○ Service utilities such as electricity, gas, oil and water
5.3 Assess the design features of fixed installations and how they may be utilised to progress firefighting operations and assist in business continuity	<ul style="list-style-type: none"> ● Fixed installation to include: <ul style="list-style-type: none"> ○ Sprinkler, drencher and water spray projection systems ○ Rising mains, falling mains and hose reels ○ Foam and flooding systems including gas/vapour and dry powder systems ○ Automatic fire detection and alarm systems ○ Communication and security systems

6. Incidents Involving Transportation

Assessment Objective	Knowledge, Understanding and Skills
6.1 Explain the principles of construction of ships/boats and assess the hazards and actions that should be considered when working with ships/boats and marine infrastructure	<ul style="list-style-type: none"> ● Design and construction of ships including: <ul style="list-style-type: none"> ○ General cargo ○ Container ○ Chemical and gas carriers ○ Bulk carriers ○ Passenger vessels including liners ○ Warships ● Hazards and risks when working: <ul style="list-style-type: none"> ○ Alongside waterways, docks, harbour and marina infrastructure. ○ On or with ships and boats ● Measures incorporated into ships to assist firefighting and provide fire protection ● Concept of buoyancy and procedures for ensuring stability during firefighting operations ● Factors relevant to ship firefighting both in ports and at sea
6.2 Explain the principles of construction in relation to railway systems and assess the hazards and actions that should be considered when working with railways and rail infrastructure	<ul style="list-style-type: none"> ● General features of railway networks and infrastructure ● Types, design and construction of trains and rolling stock ● Hazards and risks when working: <ul style="list-style-type: none"> ○ Alongside railway lines, sidings and at other rail premises. ○ On or with trains and rolling stock ● Rail and train power systems ● Identification of freight including signage of goods and information retrieval systems ● Firefighting and emergency procedures for railway incidents

<p>6.3 Explain the principles of construction in relation to all types of vehicles and assess the hazards and actions that should be considered when working with vehicles and on roadways</p>	<ul style="list-style-type: none"> • Vehicle design, to include: <ul style="list-style-type: none"> ○ Motor cars ○ Light and heavy goods vehicle ○ Buses and coaches ○ Unconventional and specialist vehicles • Hazards and risks when working: <ul style="list-style-type: none"> ○ On roadways and motorways ○ With vehicles including cars, LGVs and specialist vehicles • General features of road networks • Identification of freight including signage of goods and information retrieval systems • Fuel systems, materials involved in vehicle construction and supplementary restraint systems • Firefighting and emergency procedures for incidents on roadways
<p>6.4 Explain the principles of construction of aircraft and assess the hazards and actions that should be considered when working with aircraft and at aerodromes</p>	<ul style="list-style-type: none"> • Design of aircraft to include: <ul style="list-style-type: none"> ○ Civil and military aircraft ○ Passenger and freight aircraft ○ Both fixed wing and rotary wing aircraft • Hazards and risks when working: <ul style="list-style-type: none"> ○ At aircraft crash sites both on and off an aerodrome ○ With civil and military aircraft, including fixed wing and rotary wing aircraft • Firefighting and emergency procedures for incidents involving aircraft and/or airports