IFE Level 3 Certificate in Aviation Fire Operations

Qualification Specification

Qualification Number: 603/6608/4

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.

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 the 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 i.e.:

- Facilitate awareness of fire issues and developments through the communication of ideas, knowledge and 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 priorities. The 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 3 Certificate in Aviation Fire Operations

Introduction
The IFE Level 3 Certificate in Aviation Fire Operations has been developed by the Institution of Fire Engineers (IFE) in partnership with aviation fire experts (civilian and military).

The qualification focuses on planning and managing activities to resolve fire and rescue incidents in aviation (civil and military) contexts. It covers pre-planning for incidents, resolving incidents and post-incident activities.

This qualification can be used as an optional Certificate to achieve the Level 3 Diploma in Fire Science and Fire Safety. For information, please see - https://www.ife.org.uk/IFE-Qualifications-with-Syllabus-Links

Target Audience
This qualification has been designed for individuals who are based within an airport fire and rescue service and who are carrying out Watch Manager/Incident Commander roles. It will also be of interest to those who are based in fire and rescue services close to airports and who may be called upon to attend fire and rescue incidents either at an airport (to support the airport team) or off-airfield within their geographical area of responsibility.

Learning Outcomes
Candidates who achieve this qualification should be able to:

- assess fire and rescue incidents and identify appropriate action to resolve the incident safely and with regard to environmental issues
- assess the scale of an evolving incident and know when and how to escalate/hand over to appropriate colleagues
- explain the operation of firefighting equipment, knowing when to use equipment and how to manage risks associated with the use of different equipment
- explain emergency planning procedures
- understand procedures relevant to airports
- understand the specific hazards and risks in different aircraft contexts

Membership of the IFE
Achievement of this qualification enables candidates to meet the academic requirement for membership at **Technician (TIFireE) Grade**.

Completion of **three Level 3 Certificates** will meet the academic requirement and minimum credit criteria necessary for **Graduate (GIFireE) Grade** membership.

To achieve the full **Level 3 Diploma**, candidates must complete this qualification **in addition to** the following:

- The mandatory Level 3 Certificate in Fire Engineering Science
- The mandatory Level 3 Certificate in Fire Safety
- One additional IFE Level 3 Certificate

All four qualifications must be achieved **within a five-year period.**

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 (Assessment Criteria) and the scope/range/contexts in which they can be tested (Knowledge and Understanding).

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 and provides a summative assessment of the full range of learning specified in the content below.

Examinations are provided in English only.

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 48 of the 120 marks available to them via the six questions.

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. Should candidates answer more than six questions, they will not benefit as only the six best responses will be included in the final mark.

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 and 71 marks.

Distinction - this is awarded where candidates achieve a mark of 72 or above.

Fail - candidates who achieve 47 marks or fewer will receive a result showing Fail. Where candidates receive 24 marks or fewer, the result will show as 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.

Candidates will be issued with the mark achieved out of a total of 120.

Entry Requirements
There are no formal entry requirements.
As the examination is provided in English only, candidates will need to have a comprehensive understanding of the English language in order to access the examination questions.

Qualification Level
This qualification has been designed to enable candidates to demonstrate that they have attained skills and knowledge at Level 3.

Other types of qualifications that are set at Level 3 include GCE A/As levels, Level 3 NVQs and Level 3 Diplomas such as the IFE Level 3 Diploma in Fire Science and Fire Safety.

The qualifications regulator for England, Ofqual, has provided the following descriptors to illustrate the knowledge and understanding expected from those who hold qualifications at Level 3.

Level 3 Knowledge Descriptor

The candidate:

- has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that, while well-defined, may be complex and non-routine.
- can interpret and evaluate relevant information and ideas.
- is aware of the nature of the area of study or work.
- is aware 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 140 hours:

- 137 hours of learning/study. Study may be self-study (please see the section on recommended reading materials below) and may include relevant CPD and airport or fire and rescue service training programmes.
- 3 hours of assessment (directed time) i.e.: 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 parts 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 Level 4. A Level 4 qualification in Aviation Fire Operations is available from the IFE.

Further Information
Further information on examination conditions is available on the IFE website.

Recommended Reading
This qualification covers an extensive range of aircraft and aviation contexts and candidates are advised to reflect this in their study when preparing for examinations.

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 examination are advised to refer to the list below:

- Heliport Manual Doc 9261 Part 1. ICAO
- Fire Service Manual Volume 1: Fire Service Technology, Equipment and Media - Firefighting Foam – Technical, TSO
- Fire Service Manual Volume 2: Fire Service Operations - Aircraft Incidents, TSO*
- Fire Service Manual Volume 2: Fire Service Operations - Firefighting Foam (Operational), TSO
- Fire Service Manual Volume 2: Fire Service Operations - Environmental Protection, TSO
- CAA, CAP 168, http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6114
- CAA, CAP 699, http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=235
- Fire and Rescue Service Operational Guidance: Generic Risk Assessments – GRA 4.3, Chief Fire & Rescue Adviser, published by Gov.UK
- Fire and Rescue Service Operational Guidance: Aircraft Incidents, Chief Fire & Rescue Adviser, published by Gov.UK
- Airport Services Manual – Doc 9137 Part 1 Rescue & Firefighting, International Civil Aviation Authority
- Airport Services Manual - Doc 9137 Part 7 Airport Emergency Planning, International Civil Aviation Authority

Content

1. Emergency Planning and Procedures

Assessment Criteria	Knowledge and Understanding
1.1 Explain the purpose of pre-planning for any specified emergency and assess the issues for inclusion in different contexts	• Prepare for appropriate response • Protect responders, the public and the environment • Mitigate impact of incident • Purpose and content of Aerodrome Emergency Plan
1.2 Identify the key components of plans and explain the importance of each	• Airport location and topography • Access • Rendezvous points and marshalling areas • Water supplies and drainage systems • Rescue and firefighting response and capability • Communications • Air traffic control • Aircraft hazards • Position for standby for emergency vehicles • Observation and watching duties
1.3 Explain the involvement of relevant external bodies in pre-planning	• Stakeholders and local partners • Joint working in planning and incident review
1.4 Detail the categorisation of emergencies at airports	• Aircraft Accident • Aircraft Accident Imminent • Aircraft Crash – Off-airfield • Full Emergency • Local Standby • Aircraft Ground Incident • Bomb Alert/Bomb Suspected • Weather Standby • Domestic Fire
1.5 Outline the areas of an airport and assess safety implications	• Runway • Aircraft stand • Air bridge • Apron • Airside/landside security • Taxiway • Airport terminal buildings • Airport cargo buildings • Baggage areas • Maintenance facilities • Fuel storage

1.6 Outline the range of aircraft and assess the implications for different type of aircrafts in different types of incidents	• Types of aircraft:
	  ○ Fixed wing
	  ○ Rotary wing (e.g., helicopters, autogyro)
	  ○ Gliders
	  ○ Microlights

	• Civilian and military contexts
	• Incidents on and off airport to include:
	  ○ Scheduled/Chartered flights
	  ○ Passenger
	  ○ Military
	  ○ Private flights
	  ○ Cargo
	  ○ Air shows and other events

1.7 Explain the importance of Maintaining operational readiness and outline how this can be managed	• Training requirements of rescue and firefighting personnel • Methods of training available to test contingency and pre-determined emergency plans and how they can be improved • Training needs analysis • Maintaining availability of resources

2. Incident Command and Management

Assessment Criteria	Knowledge and Understanding
2.1 Understand the key principles of Incident Command as they apply to aviation contexts both on airport and off airport	• Functional areas of Incident Command Systems • Levels of management applied at operational incidents • Role of other agencies
2.2 Understand the roles and responsibilities of personnel within the incident command structure	• Role and responsibilities of the Incident Commander at Operational level • Role and responsibilities of the Sector Commander at incidents • Relationship between the Incident Commander, the Sector Commander and the Incident Command System • Role and responsibilities of Command Support • Progression at an incident from first pump attending to the arrival of a dedicated vehicle • Responsibility for determining the cause of an incident • Range and the types of evidence available at an operational incident
2.3 Understand the requirements for the successful management of risk at operational incidents	• Definition of hazard, risk and control measure • Management of risk at operational incidents • Dynamic Risk Assessment • Tactical mode options available at incidents • Hierarchy of control measures in relation to risks • Importance of evidence preservation

2.4 Understand the need for effective lines and methods of communication at incidents	• Lines of communication available at incidents in relation to an Incident Commander's span of control • Impact of poor or inappropriate communication • Methods of briefing of crews at operational incidents • Model for sectorisation at operational incidents
2.5 Understand principles for general control, tactics, and strategy in resolving emergency incidents and explain how and when these principles should be applied in different contexts	• Need for evacuation at fires • Strategy and tactics involved in rescue work • Objectives of ventilation at fires • Aims and principles of salvage/damage control • Procedures for ensuring the safety of both personnel and public • How to identify signs and symptoms of stress in relation to trauma and/or work-based activity • Actions to reduce the exposure to, and impact on, operational personnel and casualties • Issues to take into consideration in establishing inner and outer cordon distances • Environmental considerations and actions to minimise environmental impact

3. Provision for Firefighting and Rescue Facilities at Airports and Airfields

Assessment Criteria	**Knowledge and Understanding**
3.1 Explain the categorisation of airports in relation to the firefighting protection to be provided and assess implications	• Relevance of size and type of airport (and the types of aircraft using the airport) when determining the fire protection required including vehicles, equipment and personnel for firefighting • Categorisation determined by aircraft overall length and maximum fuselage • UK 10-point scale as identified by Civil Aviation Authority OR other relevant categorisation (national/international method)
3.2 Understand how to deploy firefighting equipment and other resources to deal with on-airport and off-airport scenarios	• Detail the provision of principal and complementary extinguishing media and describe their characteristics • Discharge rates for extinguishing agents • Provisions of rescue and firefighting vehicles and requirements for response times and specifications • Explain the meaning of the term "critical area concept"

3.3 Assess the provision of water supplies at airports and airfields and determine strategies to resolve issues	• Provision of supplies of water for firefighting purposes • Operational use of water from its supply for firefighting purposes

4. Aircraft Construction

Assessment Criteria	Knowledge and Understanding
4.1 Understand the principles of aircraft construction, the implications for fire and rescue situations and the hazards associated with different materials and different types of aircraft	• Materials normally used in aircraft construction • Use of Man Made Mineral Fibres (MMMFs) • Features of aircraft construction relevant to different types of aircraft: passenger, cargo, private • Features of power systems and services • Features of internal fixtures and fittings • Auxiliary power units (APU) • Aircraft access and evacuation systems • Fixed fire protection systems in aircraft • Classify passenger emergency exits in terms of type, size and location and be able to determine the number and type of exits to be provided for each side of an aircraft according to passenger carrying capacity • Hazards relevant to cargo aircraft including design features and shipping of hazardous goods • Shipper's Declaration for Dangerous Goods
4.2 Describe the various engines used in aircraft and assess the hazards associated with them	• Piston engines • Gas turbine engines
4.3 Describe the types of aviation fuels that are used and assess the hazards associated with them	• Provision of fuel tanks in aircraft (including military aircraft) • Types of fuel used in aircraft (including military aircraft)
4.4 Understand the principles of rotary wing aircraft construction and the implications for fire and rescue situations	• Describe the construction details of rotary wing aircraft • Categorise the different types of helicopter • Discuss access and escape routes provided in rotary wing aircraft • Position of engines and the general features of rotor blades
4.5 Understand the principles of military aircraft construction and the implications for fire and rescue situations	• Access to and exits from military aircraft including cockpit canopies, break-in points and emergency hatches • Types of power systems and services that may be found in military systems • Types of storage of armaments and pyrotechnics found on board military aircraft

5. Aircraft Firefighting and Rescue Procedures, Equipment and Techniques

Assessment Criteria	Knowledge and Understanding
5.1 Understand the types and causes of aircraft ground incidents and fires that can be encountered and the methods of dealing with them	• Fuselage and passenger cabin fires • Wheel fires and hot brakes • Engine fires • Running fuel fires • Metal fires • Freight-related hazards and incidents • Aircraft fuel spillage with and without a fire occurring • Actions of fire and rescue service at “high speed accidents” and “low speed accidents”
5.2 Understand the fire tactics and techniques that need to be adopted for attending incidents at airports and assess the implications for different situations	• Approaching the incident • Appliance positioning • Application of extinguishing agents including foam • Use of additional water supplies and extinguishing agents • Locating the incident • Casualty handling • Working with other organisations • Use of Shipper’s Declaration for Dangerous Goods
5.3 Understand and apply the principles of rescue procedures for rescue from civil aircraft including rotary wing	• Methods used to evacuate an aircraft by the fire service and rescue personnel • Methods of entry that can be used to gain access to an aircraft • Methods of release and rescue of aircrew • Methods used by the flight crew to evacuate an aircraft
5.4 Understand and apply the principles of rescue procedures for rescue from military aircraft	• Methods of entry used to gain access to military aircraft including access via cockpit canopies • Dangers presented by ejection seats and the principles of making them safe • Methods of release and rescue of aircrew

6. Post-Incident Procedures and Considerations

Assessment Criteria	Knowledge and Understanding
6.1 Understand how to close down the operation phase of an incident	• Measures to hand over control of an incident to an appropriate person, agency or authority • Actions to identify and minimise any unresolved hazards and associated risks within operational constraints
6.2 Explain the process to remove wreckage and other equipment following the incident and assess the safety and environmental issues	• Movement of wreckage and de-fuelling • Methods of dealing with ignition sources and the evacuation of the surrounding area • Decontamination of personnel and equipment • Environmental considerations

6.3 Explain the process to manage the removal of bodies and personal belongings	• Removal and moving of bodies including the recording of positions and locations • Removal and collation of personal belongings
6.4 Determine the requirements for preservation of evidence at a scene by applying basic fire investigation principles	• How to identify and preserve potential evidence identified at the incident • How to remove and preserve equipment that could provide evidence from the scene

6.5 Understand the principles of, and value of, debriefs and apply these principles to different incident contexts	• How to gather and review all relevant information from internal and external sources
	• How to engage crew in debriefing and to review crew welfare and learning issues
	• How to implement remedial measures to improve future practice and performance
	• Types of de-brief:
	  ○ hot
	  ○ cold
	  ○ critical incident

7. Heliports

Assessment Criteria	Knowledge and Understanding
7.1 Understand the operation of fire protection measures in relation to heliports	• Levels of fire protection required for heliports • Categorisation of heliports in relation to the provisions of fire protection facilities to be provided • Training for personnel • Response times for fire and rescue personnel at both surface and elevated heliports