

# IFE Level 4 Certificate in Fire Safety and Fire Science

## Unit 4 – Aviation Fire Operations

### Examiner Report – March 2019

#### Introduction

Entries for this examination were low with only 28 candidates booking examinations. 26% of candidates who sat the examination attained a Pass.

Candidates generally performed best on question 7; they performed least well on question 8.

Candidates often provided irrelevant information in response to questions. Candidates are advised to read the questions carefully and to be aware that marks can be awarded only where the information provided is relevant to the specific question.

#### Question 1

*Airport Rescue and Firefighting Services (ARFFS) must achieve the response time of two minutes and not exceeding three minutes to the end of each runway, as well as any other part of the movement area, in optimum conditions of visibility and surface conditions.*

*a) Explain the meaning of the term 'Response Time'. (2 Marks)*

*b) Describe the pre-planning that should be carried out to assist in achieving this requirement. (18 marks)*

#### **Examiner Feedback**

An effective intervention by the ARFFS is fundamental to achieving success at an aircraft incident. Therefore, understanding the meaning of response time is the cornerstone of ARFFS operations. Some candidates did not appear to be aware that response time (which is an internally agreed term) is: the time between the initial call to the service and the time when the first responding vehicle(s) is(are) in position to apply foam at a rate of at least 50 per cent of the discharge rate for the airport category.

Question b) was often answered poorly with many candidates referring only to training of ARFFS personnel, rather than answering the actual question which was focussed on pre-planning. Examples of responses which would have secured marks are as follows:

- ARFFS vehicles should be designed and developed to meet the standards set by ICAO.
- The fire station should be located so that the access for ARFFS vehicles into the runway area is direct and clear, requiring a minimum number of turns.
- At some airports it may be necessary to consider the provision of more than one fire station, each located strategically in relation to the runway pattern.

- Consideration should be given to designating access routes taking into account the likelihood of debris and casualties.
- Emergency access roads should be provided on an airport where terrain conditions permit their construction to facilitate the achievement of minimum response times.
- Attention should be given to the provision of ready access to approach areas up to 1000m from the threshold, or at least from the threshold to the airport boundary.
- Where the airport is fenced, access to outside areas should be facilitated by the provision of emergency gates or frangible barriers.
- Sufficient vertical clearance should be provided from overhead obstructions for the largest vehicles.
- Wherever possible, roads should permit the passage of vehicles in both directions.
- Suitably designed corners, with adequate radii for the manoeuvring of major RFF vehicles, should be provided to facilitate the departure of responding vehicles through the airport fence emergency gates or barriers.
- If any gates are non-frangible and secured by other mechanical means, access through the gate(s) should be readily available, such as but not limited to, the provision of keys to the gates to be kept in the ARFFS vehicles.

## **Question 2**

*The method for the determination of Airport Rescue and Firefighting Services (ARFFS) requirements for aircraft is based on the concept of a Critical Area (CA) to be protected in any post-accident fire situation to permit the evacuation of the aircraft occupants.*

- Describe the Critical Area for helicopters. (10 Marks)*
- Calculate the ICAO aircraft category and water on wheels requirements for a helicopter (fuselage length is 16.66 metres, average fuselage width is 2 metres) when operating from a surface level heliport. (10 marks)*

## **Examiner Feedback**

This question was the least popular option for candidates. However, many of the candidates that attempted it secured over 14 marks, indicating a thorough understanding of the subject.

## **Question 3**

*As the Senior Airport Fire Officer (SAFO) you have been tasked to create a specification for a new Airport Rescue and Firefighting Services (ARFFS) vehicle to replace an aging appliance within the airport vehicle fleet. Outline the factors that you would consider in drafting the specification and also the characteristics required for this new vehicle which is required to hold less than 4500 litres of water. (20 marks)*

## **Examiner Feedback**

Many candidates concentrated on providing information relating to the training of ARFFS personnel rather than concentrating on the question. This meant that there were many irrelevant responses where marks could not be awarded.

The question specifically requested information on a vehicle holding less than 4500 litres of water. ARFFS vehicles are categorised as being either less than 4500 litres or more than 4500 litres of water. Some candidates did not take this into account in their responses and some points that were made were not relevant to the type of vehicle specifically referenced in the question.

## **Question 4**

*The principal objective of the Airport Rescue and Firefighting Services (ARFFS) is to save lives in the event of an aircraft accident or incident occurring at, or in the immediate vicinity of, an airport. The ARFFS is provided to create and maintain survivable conditions, to provide egress routes for occupants and to initiate the rescue of those occupants unable to make their escape without direct aid. During an aircraft accident or incident, the aircraft crew members' efforts are directed towards a common goal i.e. safety of all occupants of the aircraft.*

*Describe the ways in which the ARFFS and aircraft crew liaise and work together in order to ensure the safety of passengers prior to, during and following a survivable aircraft crash on or near the aerodrome. (20 marks)*

## **Examiner Feedback**

The question specifically referenced liaison with aircraft crew but many candidates provided answers centring on liaison with ATC or other ground services. This meant that there were many irrelevant responses.

Aircraft crews and ARFFS personnel should carry out collaborative work centred around the need to evacuate aircraft passengers. Examples of points that could have been covered in the question include the following:

- Since conditions and facilities differ greatly on most airports, crew members must remain primarily responsible for the aircraft and its occupants. The final determination to evacuate from the aircraft and the way evacuation shall be carried out must be left to the discretion of the crew, provided they are able to function in a normal manner.
- It will be the duty and responsibility of the ARFFS to assist the air crew in any way possible.
- Since air crew visibility is restricted, ARFFS personnel should make immediate appraisal of the external portion of the aircraft and report unusual conditions to the aircrew.
- Protection to the over-all operation is the primary responsibility of the ARFFS personnel.
- In the event aircrew are unable to function, the ARFFS personnel will be responsible for initiating necessary action.
- Crew members are trained in the use of emergency evacuation slides provided at normal and emergency exit doors to assist in the rapid evacuation of passengers.

- Where these slides are provided and are in use when ARFFS personnel arrive, air crew members should not be disturbed unless the slides have been damaged by use or fire exposure.
- In the latter case, ladders or emergency stairs, provided by the ARFFS personnel should be placed into immediate service.
- The use of emergency evacuation slides will usually provide a much more rapid evacuation than conventional steps or stairs where speed of evacuation is mandatory. It is preferable to use the aircraft equipment.
- ARFFS personnel should stand by at the foot of the slides to aid exiting persons to their feet and direct them to a staging area a safe distance from the scene.
- To coordinate better evacuation procedures, it is often desirable to establish direct contact with the flight crew members.
- Most airport emergency equipment carries two-way radios, operating on ground control frequency.
- Pre-arrangement with the control tower will ensure that the aircraft changes to this frequency if time and the nature of the emergency permit.

### **Question 5**

*Military aircraft can differ from their civilian counterparts although, in some circumstances, they may use the same airframe. Explain the information that would need to be included within a training package covering military aircraft to enable Airport Rescue and Firefighting Services (ARFFS) to successfully respond to incidents. (20 marks)*

### **Examiner Feedback**

Many candidates provided brief responses which failed to provide evidence of understanding other than mentioning ejection seats and 'bombs'. Examples of the types of information that might be covered in training packages follows:

- Role/Type of aircraft.
- Aircraft construction including types of materials used which may necessitate specialist equipment.
- Issues affecting safe approach, taking into consideration, offensive, defensive systems, including AES systems which may necessitate a 45° approach.
- External safety considerations, including recognition of standardised aircraft markings
- Colour coding of weapon systems
- POL Pressurised Pipeline systems
- Methods of entry into aircraft, taking into consideration canopy type and method of entry - normal, emergency, forcible or alternative on offensive, defensive and training aircraft.
- Making aircraft/ejection seat systems safe, taking in to account any Command Ejection System fitted
- Stabilisation of aircrew requirements which may require a more controlled release/removal process
- Safe removal of aircrew
- Systems that require to be made safe prior to setting a safety cordon around aircraft
- Additional hazards associated with military aircraft: eg weapons, defensive suites, radar radiation hazard, infra-red and laser emissions etc

## **Question 6**

*Aerodrome Managers are required to ensure that in preparation for an aircraft incident emergency, planning has been carried out and an Aerodrome Emergency Plan has been created in consultation, and shared with, the local resilience forum. Describe five examples of typical information that should be contained within an Aerodrome Emergency Plan. (20 marks)*

### **Examiner Feedback**

The question was the most popular option for candidates. Again, there were numerous irrelevant responses with many candidates drifting into explaining how the emergency plan should be tested rather than focussing on the information that should be contained within the aerodrome emergency plan.

Some candidates ignored the instruction in the question to focus on five examples of content areas. However, marks were given for relevant information. Types of content areas which could have been discussed in detail were:

- Airport location and topography
- Access
- Rendezvous points and marshalling areas
- Water supplies and drainage systems
- Rescue and Fire Fighting Services response and capability (civil and military)
- Communications
- Air traffic control
- Aircraft associated hazards
- Complex locations/difficult environments
- Aerodrome familiarisation visits

## **Question 7**

- a) *It is vitally important that Airport Rescue and Firefighting Services (ARFFS) personnel are familiarised with all regulations, national and local, regarding movements of wreckage and disposal of human remains and the preservation of evidence following an aircraft crash. Describe the procedures and the reasons why these must be observed by ARFFS personnel once fire suppression and survivor rescue have been completed. (10 Marks)*
- b) *Explain the socio-economic and environmental consequences that may follow an aircraft crash. (10 marks)*

### **Examiner Feedback**

There were many good responses to this question and candidates often secured good marks – the average mark attained for the question was 9. Responses to part a) were particularly good.

## **Question 8**

- a) *At the scene of an incident involving a large passenger carrying aircraft, the Incident Commander may choose to carry out sectorisation of the incident utilising the Incident Command System. Compare the different approaches to sectorisation that an incident Commander may take regarding attendance at:*
- i) *an internal (cabin) fire. (2 Marks)*
  - ii) *an external (engine) fire. (2 Marks)*
- b) *Aerodrome Emergency Planning exercises will have identified the procedures to be followed in the event of an aircraft crash. This will normally result in a multi-agency response from both internal resources such as Airport Rescue and Firefighting Services (ARFFS) and external support provided by the Civilian Emergency Services. This response will often require that Command Support is instigated during the early stages of the incident. Describe the Command Support function. (16 marks)*

## **Examiner Feedback**

This question was not a popular choice for candidates.

Those candidates that did respond to the question often failed to demonstrate understanding of the incident command system.

In responding to part a), candidates often failed to articulate approaches to sectorisation in the two contexts provided. Candidates should have identified that:

- Internal Fire - aircraft will generally be sectorised by splitting aircraft wing tip to wing tip. As aircraft will generally be pointing in to the wind, unless aircraft is parked on ASP Sector 1 will be the front half of the aircraft, with crews concentrating on firefighting. Sector 3 will be towards the rear of the aircraft, with crews concentrating on search and rescue.
- External Fire - aircraft will generally be sectorised by splitting aircraft nose to tail. Sector 1 will generally be the side of the aircraft where the fire is located. Crews will concentrate on firefighting. Sector 3 will be the opposite side of the aircraft, with crews concentrating on search and rescue.

Few candidates demonstrated sufficient understanding of the command support role to secure more than a few marks for their response to part b)

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