

IFE Level 3 Diploma in Fire Science and Fire Safety

Unit 4 – Aviation Fire Operations

Examiner Report – March 2020

Introduction

23% of the candidates who sat the examination achieved a pass.

Candidates generally performed best on questions 2, 5 and 8. The least well answered questions were questions 1 and 7 where it was common for candidates to attain only low marks.

Question 1

a) *Dangerous goods carried by air are accompanied by a Shipper's Declaration. Describe the appearance of the document, state where it is located and outline the information contained in this document. (8 marks)*

b) *Detail the Airport Rescue and Firefighting Services (ARFFS) tactics in dealing with a Lithium Ion Battery Pack as found on a B787 Dreamliner. (12 marks)*

Examiner Feedback

This was not a popular option for candidates and those candidates that did respond to the question often provided only brief responses that scored only low marks.

Part a) should have been straightforward but few candidates provided sufficient detail to score more than a few marks. Candidates should be aware of the following:

- The shipper's declaration for dangerous goods can be distinguished from other flight documents by the red and white hatching on each side of the document.
- The shipper's declaration is produced by the shipper. There should be one copy at the originating point with one other travelling with the dangerous goods.
- The document must contain: proper shipping name, UN Number, UN class, division and subsidiary risk(s), packing group (if applicable), packing instructions and type of packaging, net quantity and number of packages.

Part b) focused on a current area of training and an area that firefighters should be preparing for. This area was poorly understood. Examples of points that would have secured marks include:

- A battery failure reaction should be fully contained within the stainless steel enclosure with any gasses vented overboard.
- Passengers and crew are safe inside the airplane. Passenger evacuation is not expected for a battery failure.
- Evacuate area around exterior of the airplane upwind to at least 18m/ 60 ft. from airplane.

- While venting, make no attempt to access electrical and electronic bay.
- Confirm airplane power is shut down by communicating with the flight deck prior to making access.
- Don all fire-fighting Personal Protective Equipment including Self Contained Breathing Apparatus (SCBA) when entering the Hot Zone (9m/30ft).
- If battery is not venting or venting is complete, access the electrical and electronic bay to ensure there is no other visible fire source.
- In the event of visible flame, Halon (or Halon replacement) is the recommended agent to suppress a fire.
- If Halon, or Halon replacement is unavailable, then CO2 would be the recommended agent.
- Do not use dry chemical or powder of any kind.
- Flood the electrical and electronic bay with appropriate agent for approximately 20 to 30 seconds and then close the bay hatch for at least 60 seconds.

Question 2

- a) *State the classifications of Civilian Aircraft Emergencies and provide a brief description of each type.* (16 marks)
- b) *Describe how a Passenger Evacuation Management System (PEMS) operates.* (4 marks)

Examiner Feedback

Part a) of the question was usually answered well with most candidates able to attain a good proportion of the marks available.

Part b) was less well understood and this part of the question was often omitted completely. Some candidates wrote about the role of the flight crew/attendants evacuating passengers rather than the passenger evacuation management system operating in the airport. Candidates who secured marks explained that these arrangements are:

- illuminated signs with a loud speaker capability (visual and audible directions)
- carried on the rear of airfield operations vehicles.
- erected in a safe location outside the inner cordon and within the outer cordon, up wind and uphill from the incident
- used for passengers who require medical treatment

Question 3

- a)
- i) *Describe the hazards when approaching a military fast jet.* (7 marks)
- ii) *Describe the control measures for the positioning of appliances and personnel when approaching a military fast jet.* (3 marks)
- b) *Outline the sequence of events for the rescue of aircrew from a military fast jet.* (10 marks)

Examiner Feedback

Part a) of the question was usually answered well with many candidates gaining most, if not all, of their marks for this question for their response to part a).

However, the rescue process was not well understood and few candidates gained marks for their response to part b).

Question 4

In relation to an internal fire in a commercial passenger aircraft:

- a) *describe the hazards faced by Airport Rescue and Firefighting Services (ARFFS) personnel.* (12 marks)
- b) *describe the control measures that should be implemented.* (8 marks)

Examiner Feedback

The average mark achieved for this question was 7. As the content of this question reflected the core role of those working in ARFFSs and covered basic understanding, it was disappointing that candidates did not attain higher marks.

Question 5

- a) *Describe the features and uses of an Auxiliary Power Unit as found on commercial aircraft.* (6 marks)
- b) *In relation to firefighting foams, define the following terms:*
- i) Induction Ratio*
 - ii) Foam Solution*
 - iii) Critical Application Rate*
 - iv) Expansion Ratio*
 - v) Aspirated Foam* (5 marks)
- c) *Describe the considerations for the Airport Rescue and Firefighting Services (ARFFS) when attending an incident involving an engine fire.* (9 marks)

Examiner Feedback

This question was the most popular option for candidates.

In responding to part a), some candidates appeared to lack understanding of APUs. Candidates should be aware that:

- An auxiliary power unit is a turbine engine on an aircraft which is to provide energy for functions other than propulsion.
- The primary purpose of an aircraft auxiliary power unit is to provide the aircraft with power when the main engines are not operating.
- It operates the aircraft electrical system, the aircraft pneumatic power, heating systems and ventilation/air-conditioning systems
- The location of the auxiliary power unit is primarily in the tail of the aircraft with a rear exhaust and an access panel underneath; however location can vary.

Responses to part b) were patchy; again, this should have been a straightforward question for those working in ARFFS contexts.

Responses to part c) were often brief and lacked sufficient detail to score high marks. Candidates working in ARFFS should be familiar with this context and know how to respond. Examples of points that would have scored marks include:

- Ensure safe and appropriate positioning of appliances and crews.
- Appropriate personal protective equipment and respiratory protective equipment must be worn at all times.
- Ascertain hazard zones in front and to the rear of engines
- Set up and maintain strict cordon control.
- Ascertain which area/part of the engine is involved.
- Control and contain fire and heat to prevent spread to wing and fuselage.
- Control/Extinguish running fuel fires to prevent formation of spillage fires that could threaten the integrity of the fuselage.
- Where there has been obvious heat transmission, the wing and fuselage should be sprayed with large amounts of water, check for transmission of heat inside aircraft
- In high mounted engines and auxiliary power units, be aware of collapse and residual fuel leaks.
- Beware of residual fuel leaks when opening cowlings to gain access.
- Beware of rotating propellers (however slowly) and the intake and exhaust of jet engines.
- Unless there is an immediate danger of escalation, extinguish fires by applying media which causes the minimum of additional damage e.g. CO₂, water.
- Unless there is an immediate danger of escalation, use only the minimum amount of appropriate media to extinguish the fire.
- Use of onboard extinguishing systems

Question 6

- a) *Describe the factors that should be considered when establishing Emergency Rendezvous Points (RVPs) and marshalling areas for an off-site incident. (6 marks)*
- b) *Emergency Rendezvous Points (RVPs) require management whilst in operation. Outline the responsibilities of the officer managing a RVP. (6 marks)*
- c) *The Emergency Planning Committee includes both on-airfield and off-airfield agencies. Describe the responsibilities of the committee giving examples of tasks that would be performed by the committee. (8 marks)*

Examiner Feedback

When responding to part a) some candidates failed to appreciate that the incident was “off-site” and provided responses based on on-site incidents.

Responses to parts b) and c) were often patchy with candidates providing only brief responses and therefore securing only few marks.

Question 7

Following an accident involving an aircraft, it is usual for a thorough investigation to take place.

Systems and equipment found on commercial aircraft and on smaller aircraft may be of use to investigators. Identify and describe the equipment found on aircraft that may be used for investigation purposes and explain the process to be followed by Airport Rescue and Firefighting Services (ARFFS) personnel in relation to this type of equipment when attending an incident. (20 marks)

Examiner Feedback

This question focused on the “*systems and equipment found on commercial aircraft and on smaller aircraft [that] may be of use to investigators*”. Unfortunately, many candidates failed to focus their responses on this aspect of the question and wrote about investigations in general. It was common for candidates to write at length about preserving evidence. This meant that responses were often irrelevant and candidates achieved few, if any, marks.

Candidates who identified and described systems and equipment which could provide relevant information such as flight data recorders, cockpit voice recorders, ground proximity warning system units, quick access recorders, global positioning units and on board camera systems were able to score marks.

Question 8

- a) *Using the Critical Area Concept and Firefighting Media Table, calculate the amount of water required for the production of Type B Foam for an Airbus A320 aircraft and confirm its Airport Rescue and Firefighting Services (ARFFS) Category. All working out must be shown.* (17 marks)

The following information has been provided:

Fuselage length = 35.57m.

Fuselage width = 3.95m.

Rate of Application for Q1 = 5.5 Litres.

Q2 % for Cat 6 = 100%

- b) *State the quantity of water and foam and discharge rate that should be available for Category 8 airports.* (3 marks)

Examiner Feedback

This was the least popular option on the examination paper. However, those candidates that attempted the question often performed well. The average mark achieved was 8.

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