

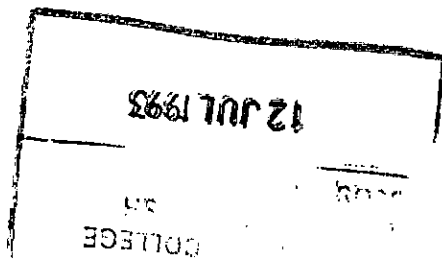


HOME OFFICE

Horseferry House Dean Ryle Street London SW1P 2AW

Direct line 071-217

Switchboard 071-217 3000



Your reference

Our reference

Date

6 July 1993

To: All Chief Officers

Dear Chief Officer

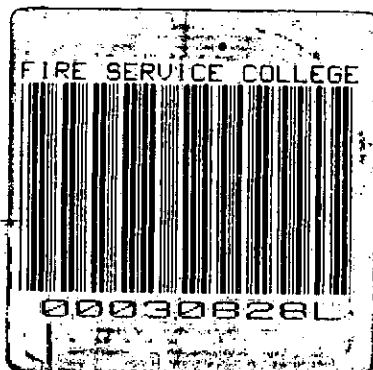
DEAR CHIEF OFFICER LETTER 7/1993

Items

1. Cross ventilation in high rise buildings
2. Civil disturbances
3. Management of emergencies at civil airports and aerodromes
4. Rope rescue procedures and equipment - Technical Bulletin 1/1990 (2nd edition)
5. Computer modelling of large oil tank fires
6. Incidents involving radioactive materials - Technical Bulletin 2/1993
7. Firecode - Supplement One to Health Technical Memorandum 81: "Fire Precautions in New Hospitals"
8. Form FP1 "Application for a Fire Certificate": Transfer of stocks to Woking Depot and updating of notes on completing the application form.

Yours faithfully

SIR REGINALD DOYLE
Her Majesty's Chief
Inspector of Fire Services



F93001099



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Date 16 July 1993

To: All Chief Officers

Dear Chief Officer

DEAR CHIEF OFFICER LETTER 7/1993 - Issued on 6 July 1993

It has come to light that an error in the copying process has resulted in a page of text from Item 2 appearing on the back of Item 1.

Correct versions of Items 1 and 2 are attached with apologies for any inconvenience.

Yours sincerely

SIR REGINALD DOYLE
Her Majesty's Chief
Inspector of Fire Services

CROSS VENTILATION IN HIGH RISE BUILDINGS

1. Chief Fire Officers will wish to be aware that in some recent fires which have occurred on the upper floors of high rise buildings, the sudden failure of external glazing possibly combined with the influence of high winds, appears to have resulted in uncontrolled cross ventilation. This has led to an unexpected and rapid development of the fire, endangering the lives of firefighters.

2. The phenomenon may be cross ventilation or backdraught or a combination of both. A research project to review the applicability of venting at large fires has recently commenced. This project will include a study of flashover and backdraught, since it would not be practical to consider venting without a clear understanding of these phenomena. Further guidance may be issued on completion of this work.

3. In the interim the existence of this potential hazard should be drawn to the attention of personnel who should be reminded of the guidance in the Manual of Firemanship Book 11 Part 1 Chapter 5 section 8 and Book 12 Part 3 Chapter 10.

4. Personnel should treat with caution fixed hosereel equipment frequently found in high rise buildings. This equipment, particularly in older properties, is unlikely to perform as efficiently as modern hosereels. The jet power will not provide the level of protection afforded by high pressure hosereels or hoselines working from a fire appliance and brigade equipment should be used in preference whenever possible.

5. This item is for the information of Chief Fire Officers. There are no cost implications.

File reference : FEP/92 355/1500/1

Telephone contact number : 071 217 8746

CIVIL DISTURBANCES

1. Background

1.1. Guidance was issued to Chief Fire Officers on 16 July 1981 following civil disturbances which occurred in some of the major conurbations. Further guidance was issued on 6 April 1982 following major disturbances during the summer of 1981. That guidance was issued following consultation with the Home Office Police Department and Chief Fire Officers who had had experience of these civil disturbances. There have consequently been further major civil disturbances, notably in 1985. During the summer of 1992 there were further disturbances of a comparatively minor nature.

1.2. Although the earlier guidance has stood the test of time, because of the growing incidence of civil disturbances, it has been decided to up-date the guidance and reissue it. The earlier guidance is largely repeated below and the letters dated 16 July 1981 and 16 April 1982 are hereby cancelled.

1.3. This guidance is necessarily of a general nature and does not seek to cover every eventuality. Furthermore circumstances at incidents are likely to change.

2. Safety of personnel

2.1. Safety of personnel must be considered as a major priority in this type of incident, second only to the rescue of persons in danger from fire. A continual assessment should be made of the safety of personnel. There appears to be a pattern in rioting, firstly of stoning and secondly of fire raising and looting. In the first phase, it appears unlikely that much firefighting is either necessary or possible. In the second phase, in recent years there does seem to have been a growing trend of animosity being shown towards the fire service. Often firefighters have been permitted to proceed with firefighting duties unimpeded but this has not always been the case.

2.2. It is advisable for senior officers at or near the scene to keep as well informed as

possible of what is happening and to exercise caution by seeking to establish what operational activity may safely be undertaken. This is particularly difficult when fires endangering life have been reported. In some areas it has been possible for officers in pairs and wearing full firefighting uniform and helmet to establish contact with those involved on the fringe of the disturbance to enable inspection of the area to take place. In other areas officers found that they were able to attend fires on the fringe relatively unhampered. However, this was not always the case and at times fire officers had to withdraw in the face of threatened violence.

2.3. Where hand-held radios are in use appropriate precautions should be taken to:

- (a) ensure the security of the equipment;
- (b) ensure that personnel are aware of the need to use equipment discreetly, to avoid giving the impression that they are being directed (see also paragraph 3.3); and
- (c) ensure that personnel are aware that fire service radio channels are not secure and that messages can be overheard by other or unauthorised equipment.

Some brigades found it helpful to paint the word "FIRE" in white on a red background on the base of beacons mounted on car roofs to minimise the possibility of rioters mistaking the identity of fire service vehicles.

2.4. A number of brigades use protective equipment and materials, a summary of which is enclosed at Annex A. Additionally, brigades have found that the use of leather gloves is helpful when making up equipment after an incident in view of the risk from broken glass -for example, on hoses.

2.5. Officers in charge should not hesitate to withdraw personnel or appliances if endangered by rioters.

3. Liaison with Police

3.1. It is extremely important that all emergency services involved at an incident of civil disturbance are aware of the tactics being deployed by the police, and of the location of all emergency service personnel who may be committed in the vicinity of a disturbance.

3.2. The importance of close liaison between the police and the fire service is acknowledged by both services and it is recognised that this needs to extend to the appropriate local levels. It is essential that such liaison should be discreet during a disturbance. It is helpful for senior officers to establish personal contact with police officers with whom they might expect to work during a disturbance. During a disturbance fire officers should be guided by the advice of the police as to how far it is wise or possible to attempt to proceed to deal with fires and in the vicinity of a disturbance, fire service vehicles should use only routes agreed with the police.

3.3. It has been found useful to have a fire liaison officer in the police control unit at incidents. The inter agency commanders' channels should also be brought into use. Contact should be kept as discreet as possible to avoid rioters mistakenly thinking that the brigade is to be used to quell a disturbance. Firefighters should be reminded that they must at all times act strictly in accordance with the instructions of their officers in performing their duties of rescue and firefighting.

4. Mobilising

4.1. Where a large number of fires are in progress in a relatively small area, it might be of benefit if the allocation of priority of attendance was delegated to a senior officer at a forward control or rendezvous point where a number of appliances could be held, rather than leave the mobilising to brigade Control, which will often be remotely situated. Mobilising to a rendezvous point is considered more appropriate in these circumstances where individual commanders can then deploy appliances according to local information and circumstances. In cases of doubt, brigade mobilising control should seek the advice of the incident commanders. Some check may be necessary of the nature of the fire calls

received because of the possibility of hoax calls being used to secure the deployment of appliances. Holding areas of appliances should be sited in an area unlikely to be affected by rioting and away from police stations or police command posts. So as to ensure ease of access to the affected area, there should be ample room for turning appliances and good evacuation routes, which are not dead-ends.

4.2. Experiences in brigades of incidents of civil disturbance have emphasised the value of a forward control point to direct attendances in an area of disturbance. It may be necessary to carry out a reconnaissance before despatching an appliance. Some brigades use a number code system when mobilising to alert crews that disturbances are taking place in the area to which they are being sent. For example, the code might indicate a single car on fire on the highway in the area.

5. Proceeding to an incident

5.1. Routes to the forward control should be carefully selected in consultation with the police so as to avoid passing through trouble spots and those areas where police operations are being conducted as far as it possible. The speed of appliances should be kept at a moderate level to avoid any reactions from hostile crowds. The use of two-tone horns or blue flashing lights which could tend to inflame rioters should be avoided within the area of disturbance. Cab door windows should be kept shut and doors locked.

5.2. A senior officer should normally attend an incident and those officers attending should generally ride on fire appliances and not in cars, which tend to be mistaken for police cars with unfortunate results. Fire gear, including helmets, should be worn by all personnel attending incidents.

5.3. Some brigades have instructed that cab doors should be bolted from the inside for additional safety. Some have issued special "bump" helmets to drivers of appliances with limited head room. These are replaced by the normal fire brigade helmet when the appliance reaches the scene of the incident. Some brigades have developed the technique of having a flaked length of hose with hand controlled branch in position, connected to a delivery of the pump so that it can quickly be used on a fire and rapidly made up where

the crew may have to withdraw suddenly.

6. Firefighting

6.1. Where possible appliances should be parked so as to facilitate a rapid withdrawal should circumstances so dictate. Drivers should remain in the driving seat with engine running. Crews should remain together. A posting of look out personnel should be considered in view of the possible need for evacuation.

6.2. Generally it is better to work from a street hydrant, where mains pressure is sufficient, than to use the appliance pump. Hydrants should be turned on and keys and bars removed to prevent them being stolen and used by rioters. As far as practicable, appliance locker doors should be kept closed. Central locking of those doors from the crew cab is now available and may be a consideration on new appliance specification.

6.3. Reinforcing appliances are unlikely to be available in the numbers normally expected at a single major fire. In the circumstances prevailing, it could also be undesirable to have too many appliances at an incident. Firefighting should be carried out to the maximum extent that is possible. In the event of the need to evacuate, normal procedures for use of an audible warning signal and nominal rolls should be strictly followed. Delayed attendances would probably result in well established fires with consequent danger of falling walls.

7. Relationship with the community

7.1. Some brigades have found it helpful to foster good relationships with local community organisations and community relations advisers to clarify the role of the fire service in seeking to save life and property in all circumstances. Section 1(1)(d) inspections may play a part in this process. In some areas where disturbances have taken place and where the fire service has been unwelcome, crews have endeavoured to make contact with the local people. This may be difficult and what is possible will vary considerably from one locality to another. It is, however, a potentially beneficial exercise which Chief Fire Officers will wish to consider. It may also be helpful to bear the role

of community relations advisers in mind during any disturbances where, for example, rumours may be spread that the brigade is being employed to quell a disturbance.

8. General

8.1. It is very important to consult and liaise with other emergency services before disturbances take place. Arrangements should be made for the exchange of any advance information that disturbances might occur in specific areas.

8.2. Control room personnel should be trained to deal with this type of incident (see paragraph 4.1 above).

8.3. Officers in charge of appliances and all personnel should be thoroughly briefed on the likely situation, both before disturbances occur and before being committed to disturbance areas. They should be reminded of their role and the importance of their own safety.

8.4. Brigades will need to decide upon the degree of radio traffic permissible in disturbance circumstances. It should be borne in mind that appliances may be ordered to an area in which a disturbance develops after mobilisation. In such cases the officer in charge of the attending appliances will have to use his/her discretion on the degree of firefighting that takes place and he/she should ensure that the brigade control is made aware immediately by use of radio that disturbances are in progress.

8.5. Where appliances are deployed to areas involved in civil disturbances, a report should be made to the Home Office Fire Services Division along the lines of Annex B attached to this letter. Messages can be faxed on 071 217 8731.

Contact telephone number: 071 217 8746

File reference number: FEP/92 3/1500/1

PROTECTION OF FIRE BRIGADE PERSONNEL AND EQUIPMENT IN CIVIL DISTURBANCES

The protection of personal equipment and uniforms

1. Existing fire uniform is adequate for firefighting duty, although fire tunics can produce a "wick" effect and overtrousers can shrink or melt as a result of burning petrol splash.
2. It is possible that the issue of anti-flash hoods and leather type gloves could increase protection.
3. A fire helmet and visor should provide sufficient protection against missiles. The most suitable visor material at present known is polycarbonate. This is reasonably heat resistant and is impact and abrasion resistant. (Acrylic or perspex whilst having good heat resistant qualities, is soft and easily shattered and abraded giving reduced vision).

Vehicle glass protection including lighting

4. Vehicle protection and protection for the occupants of the vehicle can be achieved in one of three ways:-
 - (a) By fixing external wire mesh to the vehicle to cover lights and windows. This is likely to provoke trouble and its use is therefore discouraged.
 - (b) By installing Makrolon plate behind the windscreen or cab glass. Makrolon plate is a polycarbonate sheet which can be supplied in various sheet sizes and thicknesses of 1-10 millimetres. It is a German product

and the only known main supplier in Great Britain is Roehm Limited of South East London who hold limited stocks. Additionally there are 50 stockists in the UK. Makrolon has high impact and abrasion resistance; is clear and colourless; is light; can be drilled, ground, bonded; can be cut with new wood and metal cutting tools; can be bent cold (minimum radius 200 x thickness); and can be easily installed by brigade workshop for quick fitting by station personnel when required.

(c) By applying adhesive film to inner surface of cab glass.

Adhesive film is used by some brigades and is the solution most likely to find favour. It is a clear film, reinforced with invisible fibres, which can be secured to inner glass surface with a water based adhesive. It is easily cleaned and it is not affected by winding windows up or down. The cost is relatively inexpensive when compared with Makrolon.

The Home Office cannot recommend the use of any particular product. Brigades will wish to form their own opinions as to what is best for their needs and to what degree the use of such equipment might in itself provoke a hostile response.

CIVIL DISTURBANCES

Please fax the following information to the Staff Officer of HMCIFS on 071 217 8731.

1. Brigade
2. Date, time and address of incident.
3. Scale and number of appliances involved.
4. Explain if the police and/or ambulance service were involved.
5. State whether objects were thrown at firefighters or appliances.
6. State whether any firefighters were injured and give details.
7. State whether any fire authority equipment was damaged and give details.
8. State whether brigade buildings were damaged.
9. Other comments.

MANAGEMENT OF EMERGENCIES AT CIVIL AIRPORTS AND AERODROMES

1. INTRODUCTION

1.1 The guidance that follows has been prepared in consultation with the Civil Aviation Authority (CAA) and BAA plc. It results from discussions which highlighted a need for central guidance to be issued on the subject of the management of emergencies at civil airports and aerodromes.

1.2 BAA owns a number of major British airports, notably Heathrow, Gatwick, Stansted, Glasgow, Edinburgh, Southampton and Aberdeen. However, this guidance is intended to cover all airports whether or not BAA owned and all aerodromes including those not licensed by the CAA (see paragraph 2.1 below). Airports generally are those airfields undertaking passenger or cargo activities. Aerodromes are airfields where general flying activity takes place. For the sake of consistency the word "airport" has been used throughout this guidance.

1.3 The guidance deals with the management of emergencies at and within about a 2 mile radius of civil airports. It is not intended to cover procedures at military airports, nor does it deal with procedures for a combined response to major disasters which are adequately covered in the Home Office document "Dealing with Disaster" and the CACFOA "Fire Service Major Incident Emergency Procedures Manual".

1.4 No previous Dear Chief Officer Letters (DCOLs) have been issued on this subject but reference should be made also to Part 1 of Book 4 the Manuals of the Firemanship entitled "Incidents involving aircraft".

1.5 This guidance is primarily to assist those brigades having an airport within their area. However, many other brigades will have an airport in a neighbouring area and they too

should be prepared to deal with emergencies. The recommendations are aimed at achieving common national standards but Chief Fire Officers may need to adapt the advice to suit local circumstances.

1.6 While the guidance deals with emergencies involving aircraft, brigades will also need to consider the risks posed by ancillary buildings at airports, including hangars, terminal buildings, which may have inter-connecting subways, fuel farms, railway premises and underground or surface rail transit systems. Additionally, areas surrounding the flight paths immediately adjacent to an airport will statistically present almost as high a risk of an aircraft accident as at the airport itself. Such areas may pose operational or tactical problems including, for example, rivers or reservoirs.

2. LEGAL RESPONSIBILITIES

2.1 All airports licensed by the CAA are required to provide rescue and firefighting services to a minimum level. (See paragraph 3.1 below). These services are commonly referred to as RFF or airport fire services. Local authority fire brigades can therefore expect the presence of an airport fire service at licensed airports, whenever the airport is open and accepting movements required to use licensed facilities, the resources being in relation to the size of the aircraft using the airport. The CAA require a minimum response up to 1000 metres beyond the ends of each runway, but it is not unusual for the airport fire service to consider a wider response area of up to 2 miles, possibly with a reduced attendance, depending upon the circumstances involved. At unlicensed airports there may be no airport fire service and local authority fire brigades should bear this in mind when planning for emergencies. There should, however, be equipment for firefighting and rescue, in accordance with the recommendation of the CAA in their publication CAP 428 "Safety Standards at unlicensed Aerodromes". See Appendix A.

2.2 Although the local authority fire brigade has a statutory responsibility under the Fire Services Act 1947 experience suggests that in the initial stages of an incident the local authority fire brigade generally augment the airport fire service. The senior airport fire service officer will be in command until the local authority fire brigade arrives at the scene,

at which time the senior local authority fire brigade officer in attendance takes command of the combined operation. However, due to the specialised nature of operations at aircraft incidents and the technical expertise of the airport fire service it would be unusual to alter the deployment of airport fire service appliances, equipment or manpower. It is essential that responsibilities are defined and in particular, command and control arrangements agreed as part of the pre-planning arrangements (See paragraph 5.2.)

3. THE ROLE OF THE AIRPORT FIRE SERVICE

3.1 Aircraft flying in the UK for specified purposes (mainly transportation of the farepaying public and flying training to achieve a rating) may use only airports licensed by the CAA. Licensees must provide the minimum rescue and firefighting services, that is, an airport fire service as appropriate to the conditions of their licence. At licensed airports the scale of the airport fire service to be provided is determined by the overall size of the largest aircraft expected to use the airport. There are currently 9 categories of airports, (category 9 being for the largest aircraft) with a special category for those airports which are licensed solely for flying instruction.

3.2 Chapter 8 of the CAA's publication CAP 168 (Licensing of Aerodromes), which is attached at Appendix B, sets out the minimum requirements to be met in the provision of an airport fire service and gives guidance on equipment, extinguishing media, personnel, training and emergency procedures. The airport fire service is to be organised, equipped, staffed, trained and operated to ensure the most rapid deployment of facilities to maximum effect in the event of an aircraft accident. Appliances must be kept ready for immediate turnout whenever the airport is available for take-off or landing of aircraft required to use such facilities.

3.3 Depending upon the airport category, various minimum facilities must be provided, including water, foam concentrate, foam monitors, breathing apparatus at Category 3 and above and ancillary equipment. The appliances provided must be capable of transporting the necessary personnel, water and extinguishing media to any incident that may occur within the response area of the airport. The operational objective should be to achieve response

times of two minutes and not exceeding three minutes to the end of each runway and to any other part of the aircraft movement area in optimum visibility and surface conditions. Response time is defined as the time between the initial call to the airport fire service and the time when the service is in a position to produce foam at a rate of at least 50% of a specified discharge rate.

3.4 Some airport fire services have an appliance dedicated to in-house domestic incidents. Experience shows that this appliance may also respond to local road traffic accidents and may be available to assist local authority fire brigades in the vicinity of the airport on request. In such instances notification arrangements to the local authority fire brigade and mutual working relationships should be developed and agreed within the emergency services co-ordination group or liaison panel referred to at paragraph 5.2 below. Such attendances are, however, outside of the CAA licensing requirements and must not affect the minimum fire cover provided by the airport fire service at the airport.

4. PRE-PLANNING

4.1 CAA licensing requirements include the provision of Emergency Orders which, amongst other things, must include arrangements for summoning externally based emergency services. Local authority fire brigades must be prepared for requests for assistance and it is recommended that they should develop a plan for such occasions. The plan will need to take into account some or all of the following items:

- size of aircraft and numbers of passengers;
- the proximity of the airport to local authority fire stations;
- speed and weight of the necessary response;
- water supplies;
- access routes;

marshalling areas;

proximity of large areas of open water, eg. reservoirs;

county and national procedures;

provision of escorts or leader vehicles for appliances;

pre-determined rendezvous points;

cargo including hazardous substances;

communications;

maps of airport premises;

road traffic rules at airports and any pre-planning regulations covered by the Air Navigation Order;

roles and functions of other emergency services and agencies;

methods of alerting essential services;

inter-service liaison arrangements;

command and control;

rescue and casualty handling;

risk assessment;

pre-determined attendance;

the need to contribute to emergency exercises;

use of airport resources;

role and liaison with neighbouring local authority brigades; and

compatibility of plans of other services.

5. LIAISON

5.1 In drawing up a plan, the local authority fire brigade will need to consider consultation and in some cases liaise closely with a number of agencies including:

Emergency Planning Officers;

Area Health Emergency Planning Officers;

Emergency Services Working Groups;

Airport Fire Service;

Police;

CAA;

National Rivers Authority;

Public Utilities;

Ambulance Service;

Coroner;

Airport Operations Manager;

Terminal Manager;

Airport Medical Manager; and

Neighbouring local authority fire brigades.

5.2 In the publication CAP 576 "Aerodrome Model Emergency Orders", the CAA recommends that an emergency services co-ordination group or liaison panel should be set up at an airport. The composition and structure of this group should be dealt with locally but might include representatives from any of the agencies listed in paragraph 5.1 above either permanently or on an ad hoc basis.

5.3 The objectives of the group should include:

to review emergency procedures and service orders relating to airport incidents regularly;

to direct and plan joint training exercises, including a full test of the airport's emergency procedures if required (see paragraph 6 below); and

to improve inter-service co-operation, co-ordination and communications.

5.4 The group should also take an opportunity to discuss the roles and the functions of other emergency services and agencies involved at any airport incident. A mutual understanding of procedures and priorities will help establish good working relationships and a spirit of co-operation.

5.5 It is recommended that a local authority fire officer, as part of his/her duties should be assigned to an airport as a liaison officer to deal with day-to-day matters and the operational training and communications requirements that arise. The liaison officer can provide a

consistent approach to pre-planning, training and operations.

6. EXERCISES

6.1 The airport Emergency Orders must detail procedures for all emergency situations in which the airport fire service is likely to become involved, including off-airport attendances, in-shore and off-shore rescue operations, chemical and radiological incidents. At airports of Category 3 or higher, the Emergency Orders must be tested by conducting:

- (a) a full-scale airport emergency exercise at intervals not exceeding 2 years; and
- (b) partial emergency exercises in the intervening year to ensure that any deficiencies found during the full-scale emergency exercise have been reviewed and/or corrected.

6.2 It may not be necessary for airports to hold a full-scale emergency exercise during any year in which they experience a major aircraft incident which involves all nominated supporting emergency services and agencies. An exercise must, however, be held as soon as practicable and in any event within 12 months to ensure that any deficiencies found during the major aircraft incident have been reviewed and/or corrected.

6.3 The purpose of a full-scale exercise is to ensure the adequacy of the plan to cope with different types of emergencies. This exercise should involve the attendance of all externally based emergency and support services. Where airports are licensed for night use, alternate full-scale exercises are to be held during the hours of darkness.

6.4 The purpose of the partial exercise is to ensure the adequacy of the response of individual participating agencies to prove certain components of the plan, such as the communications system or casualty evacuation.

6.5 In addition to the exercise required by the CAA, it is recommended that the plans of local authority fire brigades are tested by additional partial exercises including, where appropriate, table-top exercises. The emergency services group should decide the scope and

frequency of such exercises.

7. AIRPORT RESOURCES

7.1 The emergency services co-ordination group should identify what resources are available at the airport itself which could be made available for use by the emergency services at an emergency incident.

8. COMMUNICATIONS

8.1 Radio communications are essential for the swift and accurate transmission of calls to respond to an emergency and for the control and co-ordination of all subsequent rescue and firefighting operations. At all airports where air/ground facilities are provided, the CAA require all airport fire service vehicles to be provided with radio equipment. Where more than one airport fire appliance has radio equipment, there should be 2-way communication between those appliances.

8.2 At airport Category 5-9 facilities must be provided to enable the airport fire officer to communicate with the aircraft flight deck whilst the aircraft is on the ground.

8.3 At airport Category 5-9 radio facilities to enable the airport fire service to communicate with responding local authority fire services are required.

8.4 Where the location of an airport is such that an attendance to an incident might ordinarily involve appliances from an adjoining brigade, the local authority Chief Fire Officer should consult the adjoining brigade on communications matters before coming to any agreement with the airport authorities.

8.5 The local authority Chief Fire Officer will need to be satisfied that arrangements for calling the brigade to incidents at an airport and for identifying the rendezvous point for an attendance are appropriate. Dependent upon the nature of the risk, such arrangements should include a direct speech or direct data link or a dial-up arrangement utilising the Public

Emergency Call Service.

8.6 The local authority Chief Fire Officer will need to be satisfied that adequate VHF (main scheme) and UHF tactical incident communications are available to local authority fire brigade resources in response to any foreseeable incident which might occur at an airport. UHF tactical communications should be provided by means of UHF incident channels identified in Radio Frequency Fire Policy Statement FPS 16.

8.7 In determining whether UHF coverage at the airport is adequate, the objective should be to ensure that it is possible to communicate between all rendezvous points and any point on the airport. Where the necessary coverage cannot be achieved by the use of direct radio-to-radio communications, local authority Chief Fire Officers may make application to the Home Office Radio Frequency and Communications Planning Unit (Scottish Office Directorate of Telecommunications in Scotland) for permission to install a UHF base station operating on one of the two, 2-frequency UHF incident channels described in Radio Frequency Fire Policy Statement FPS 16. Coverage from fixed UHF base stations at airports should be engineered to provide radio communications on the airport and its immediate vicinity. They should not be engineered to provide radio communications between the airport fire service and the local authority appliances while the latter are enroute to an incident. Permission to use fixed base stations may, therefore, be subject to restriction on the height of the antenna and/or the radiated power.

8.8 Additionally it is recommended that the airport fire service is included in the incident tactical communications to the extent that the officer in charge of the airport fire service attendance is able to communicate directly with the officer in charge of all local authority appliances attending an incident at the airport. Such communications should be available from the moment that each local authority appliance (irrespective of its brigade) arrives at the airport, any rendezvous point, marshalling area or at the incident, whichever is the earlier. One method of facilitating these tactical communications is described in paragraph 4 of Item 9 of DCOL 5/1991.

8.9 The CAA has indicated that it considers it desirable that the officer in charge of an

airport fire service attendance to an airport incident should be in a position to contact directly the local authority brigade's mobilising control for the purposes of advising the mobilising control of revised incident information which might cause the mobilising control to re-direct the local authority brigade's attendance (or to mobilise a further attendance) or to advise the mobilising control of hazardous substances or other risks that have been identified at the incident scene.

8.10 One method of facilitating communications between the airport fire service and the local authority brigade's mobilising control is for the local authority Chief Fire Officer to permit the airport fire service to make limited use of not more than one local authority brigade VHF main scheme radio channel. Where permitted, such use will be subject to the following conditions:

- (a) such arrangements are subject to prior agreement by the Home Office Radio Frequency and Communications Planning Unit (Scottish Office in Scotland);
- (b) only one VHF channel is available for use for this purpose at each airport;
- (c) the user is exclusively limited to the airport fire service and the use is confined only to purposes agreed in advance by the local authority Chief Fire Officer under the terms of any conditions and procedures considered appropriate;
- (d) discipline and the use of the channel is to be in accordance with the normal procedures for fire service VHF assignments;
- (e) the radio callsign(s) to be used by the airport fire service is to be determined by the local authority Chief Fire Officer; and
- (f) the use of the channel is to be limited to the immediate vicinity of the airport and to operational incidents at which both the local authority brigade and the aerodrome fire service are involved.

8.11 This limited permission to use a VHF main scheme radio channel is in addition to the circumstances described in Item 9 of DCOL 5/1991 and paragraph 7 of that DCOL is amended accordingly. Whatever arrangement is employed to facilitate communications between an airport fire service and a local authority brigade's mobilising control, it is recommended that it should be equipped with an automatic recording facility.

8.12 The officer in charge of an airport fire service attendance is permitted to make use of the Inter-Agency Commanders channel for strategic liaison at an incident in accordance with the procedures described in Radio Frequency Fire Policy Statement FPS 18.

8.13 Airport fire services use UHF radio frequencies which are licensed for that use by the Department of Trade and Industry, Radiocommunications Agency. Such assignments have a bandwidth of 12.5 kHz whilst the UHF assignments used by local authority fire brigades and regulated by the Home Office have a band width of 25 kHz. Accordingly, whatever arrangements are adopted for communicating with airport fire services, they must be such that:

- (a) radio equipment is only to be used on frequency assignments for which the equipment is Type Approved (Radio Frequency Fire Policy Statement FPS 10 deals with Type Approval for equipment used in Home Office bands); and
- (b) radio equipment must operate at the appropriate band width for the frequency assignment(s) on which it is intended to be used.

8.14 Additionally, current types of hand-held radio equipment can only receive on one channel at a time. Radios which can provide a "scanning" or "priority scanning" facility are, therefore, unlikely to provide an adequate means of simultaneously operating on more than one radio channel.

8.15 Local authority Chief Fire Officers need to be aware that the foregoing may necessitate some officers having more than one hand-held radio in order to provide satisfactory communications.

9. TRAINING

- 9.1 All personnel who are likely to attend emergencies at civil airports and aerodromes should receive training appropriate to their responsibilities. Subjects considered appropriate for training are listed below and these should be incorporated within training programmes for: Firefighting crews, Officers in charge of appliances and Officers in charge of incidents and specialist officers.
- 9.2 A record identifying the types of training given and participation in exercises should be entered into each individual firefighter's training record.
- 9.3 Additional training for officers is also available through the CAA's International Fire Training Centre referred to in DCOL 1/A/1989.
- a. Aircraft design, construction and special hazards
 - b. Aircraft evacuation procedures
 - c. The role of the airport fire service
 - d. Water supplies, extinguishing media and equipment
 - e. Topography, familiarisation and liaison visits
 - f. Radio communications
 - g. Pre-determined attendance procedures
 - h. Major incident procedures
 - i. The role of other emergency services and organisations

- j. Aircraft/Helicopter firefighting tactics and procedures
- k. Aircraft/Helicopter search and rescue techniques
- l. Practical exercises and demonstrations: (see paragraph 6 above).
- m. Floor plan exercises
- n. Accident investigation procedures
- o. Post incident procedures

9.4 CAA's International Fire Training Centre's Training Note No 16. is at Appendix C.

9.5 Aircraft firefighting training facilities are being developed at The Fire Service College and by 1 June 1993, local authority Fire Officers' Courses equivalent to the CAA Fire Training Centre's course, will be available to local authority fire brigades. Further courses, as they are developed, will be offered in due course, based on both military and civil aircraft. The College also intends to introduce aircraft training exercises into core progression training to complement those already provided for other transport systems. Further information on the facilities available and course programme will be issued by the College later in 1993.

10. MEDIA

10.1 Substantial guidance is given on relations with the media at the scene of major incidents or disasters within the Home Office document "Dealing with Disaster" and the CACFOA "Fire Service Major Incident Emergency Procedures Manual". However, recognition of the role of the airport public relations department will need to be considered in the pre-planning stage. Generally, airport authorities are better able to deal with the technical aspects of media enquiries at incidents at airports where, in fact, access can be strictly controlled.

11. THE ROLE OF THE AIR ACCIDENTS INVESTIGATION BRANCH

11.1 The Air Accidents Investigation Branch (AAIB) is part of the Department of Transport and is separate from the CAA. The fundamental purpose of investigating aircraft accidents is to determine the circumstances and causes with a view to the preservation of life and the avoidance of accidents in the future; it is not the purpose to apportion blame or liability.

11.2 It is vital that an accident site should be identified and sealed off as soon as possible, only people required for rescue and firefighting being allowed access to the wreckage. The guarding of the site is the responsibility of the police. It is often necessary for wreckage to be moved for the purpose of rescue or removal of bodies before AAIB inspectors arrive. Such operations should be kept to the minimum.

11.3 Local authority fire brigade personnel should also bear in mind that the police will consider any aircraft accident site a potential scene of crime. Efforts should therefore be made to preserve evidence so far as is practicable while rescue and firefighting operations are being carried out. In particular, bodies of casualties that are fatally injured should not be moved unless it is necessary to do so to free other trapped casualties.

12. SAFETY AT AIRPORTS

12.1 In view of the potential dangers involved in the undertaking of unrestricted movements inside the airport boundary, it is considered vital that procedures be agreed on the method of escorting or directing the external emergency services to the scene of the incident. At some airports police or other authorised escorts are provided at rendezvous points.

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Telephone contact number 071 217 8746

CAA CAP 428

Safety Standards at Malicensed Aerodromes.

APPENDIX E FIRE FIGHTING AND RESCUE EQUIPMENT

The following minimum scale of equipment should be provided for immediate use on the aerodrome:

- (a) A vehicle or vehicles with cross country capability and capable of carrying the equipment and personnel specified, either on the vehicle or on suitable trailer connected to the vehicle.
- (b) A foam extinguisher containing not less than 90 litres of a foam meeting performance Level B with a discharge rate of not less than 60 litres per minute through one or more hose lines. Complementary fire fighting media in the form of 14 kg of Dry Powder, BCF or 25 kg CO₂ should be available.
- (c) Rescue equipment consisting of:
 - One axe, aircraft type non-wedging
 - One bolt cropper 61 cm
 - One crowbar 1 m
 - One heavy duty hacksaw with six spare blades
 - One pair pliers side cutting
 - One harness knife with sheath
 - One fire-resisting blanket
 - Two pairs fire-resisting gloves
 - One set screwdrivers (Phillips and slotted)
 - One top snippers
- (d) A medical first-aid pack plus at least one stretcher with blankets. The first-aid pack to include:
 - Six emergency dressings No. BPC 9
 - Six emergency dressings No. BPC 12
 - Six triangular bandages
 - Eye dressing
 - One pair scissors

The medical pack should be protected from the elements and personnel who are qualified in first-aid should be available.
- (e) Where an ambulance from the Local Authority is likely to take more than 15 minutes to respond to a call, provision should be made to provide an ambulance at the site while flying is taking place.
- (f) Not less than two persons, suitably trained and competent in the use of the fire and rescue and medical first aid equipment provided should be available at all times when aircraft are landing or taking off. They should be supplied with suitable protective clothing, including helmets with visors. They should also have knowledge of aircraft door release mechanisms and seat harness equipment.

NOTE: In respect of (e) the attendance on site of a recognised voluntary ambulance organisation may be considered as meeting the recommendations.

CHAPTER 8 RESCUE AND FIRE FIGHTING SERVICE**INTRODUCTION**

1 This Chapter sets out the requirements to be met in the provision of Rescue and Fire Fighting Services (RFFS) at licensed aerodromes. It also gives guidance on equipment, extinguishing media, personnel, training and emergency procedures. Condition 2 in the Public Use and Ordinary aerodrome licenses makes it mandatory for licensees to provide the minimum RFFS as appropriate to their aerodrome and as detailed in Chapters 8 and 9.

2 The Rescue and Fire Fighting Services are to be organised, equipped, manned, trained and operated to ensure the most rapid deployment of facilities to maximum effect in the event of an accident and at any event within the response time requirements set out in paragraph 6 of this Chapter. The level of protection to be provided at licensed aerodromes in the United Kingdom accords with the practice recommended by the International Civil Aviation Organisation.

3 MINIMUM SCALE OF SERVICES TO BE PROVIDED

3.1 The Air Navigation Order requires aircraft flying in the United Kingdom for specified purposes to use only a licensed, Government or Authority Aerodrome. At licensed aerodromes the scale of Rescue and Fire Fighting (RFF) protection to be provided is determined by the overall length and maximum fuselage width of the largest aircraft expected to use the aerodrome. However, when the number of movements by aircraft in the largest size category totals less than 700 in the busiest three months of the year, the RFF protection provided may be that appropriate to the next lower aircraft size category. A movement is either a landing or take-off.

3.2 Unless the Authority has agreed in writing to alternative arrangements, where an aerodrome has taken advantage of the RFF category reduction under the less than 700 movements rule described in 3.1, for all other movements of aircraft received on an occasional basis, the RFF cover is to be provided to a minimum of the level appropriate for the specific aircraft as detailed in Table 8.1.

3.3 When past traffic levels are unavailable to help in determining the RFF category for expected future operations, the RFF category will be assessed from the best available information.

3.4 Protection on the scale appropriate to the aerodromes RFF category determined in accordance with para 3.1 above must be provided throughout the hours a licensed aerodrome is available for use by aircraft engaged on flights required to use a licensed aerodrome, except that during a known period of reduced activity the protection provided is to be appropriate to the largest aircraft planned to use the aerodrome during that period. This planned reduction must be notified in the UK Aeronautical Information Publication (AIP).

3.5 Table 8.1 lists the aerodrome categories for rescue and fire fighting and includes a 'Special' category for those aerodromes which are licensed solely in order that flying instruction may take place. At these aerodromes, when the overall length of aircraft used for flying instruction exceeds 9 m the Directorate of Aerodrome Standards (Fire Service Branch) should be consulted on the scale of protection to be provided.

- 3.6 The services, including an ambulance at aerodromes where an ambulance is required (see Chapter 9), should be maintained for a minimum of 15 minutes after the actual time of departure of the aircraft. Maintenance of services for less than 15 minutes will be permitted only with the written agreement of the Authority.
- 3.7 Table 8.2 details the minimum amounts of extinguishing media to be carried on appliances.
- 3.8 At aerodromes category 3 and above, a secondary power supply to cover essential RFF equipment and facilities is required. These include appliance tank and engine heaters, electrically operated doors, lights and communication systems where applicable.

4 TEMPORARY DEPLETION OF RFFS

- 4.1 In the event of an unforeseen temporary depletion in the level of RFF protection it may be necessary to restrict landings and take-offs by aircraft required to use a licensed aerodrome until the promulgated level has been restored. In this context 'temporary' should be interpreted in the light of the expected frequency of aircraft operations during the depletion period. It could last for up to twelve hours overnight at a small regional airport when few movements are expected but only for two hours at a major airport over a peak traffic period.
- 4.2 It is the responsibility of the aerodrome licensee to determine the extent to which operations should be restricted and to ensure that arrangements are made to warn pilots and aircraft of any changes in the level of RFF protection available. Significant changes, that is any which warrant a restriction in usage, should be promulgated by Class 1 NOTAM and the CAA (Fire Service Branch) informed.
- 4.3 As a guide to restrictions that should be imposed due to reduction in RFF protection, operations by a particular type of aircraft should not be permitted when the level of protection falls below the minimum for two categories lower than that appropriate to the dimensions of that aircraft. For Category 2 and 3 aircraft the minimum level of protection is that appropriate to a Category 1 aircraft if restrictions are not to be imposed. Exceptions should of course be made for emergency landings, and for occasions when, in the pilot's opinion a diversion or hold may introduce a more significant hazard.

Table 8.1 Aerodrome Category for rescue and fire fighting

<i>Aerodrome Category</i> (1)	<i>Aircraft Overall Length</i> (2)	<i>Maximum Fuselage Width</i> (3)
Special*	up to but not including 9m	2m
1	up to but not including 9m	2m
2	9m up to but not including 12m	2m
3	12m up to but not including 18m	3m
4	18m up to but not including 24m	4m
5	24m up to but not including 28m	4m
6	28m up to but not including 39m	5m
7	39m up to but not including 49m	5m
8	49m up to but not including 61m	7m
9	61m up to but not including 76m	7m

* See paragraph 3.5

5 AVAILABILITY OF EXTINGUISHING MEDIA

5.1 The required quantities of media and water must be available for immediate discharge from the appliances. In addition, a 200% reserve of foam concentrate and 100% of complementary agents should be held readily available.

5.2 The management of stocks of extinguishing media

5.2.1 Consignments should be used in order of delivery to prevent prolonged storage at aerodromes. Where supply difficulties may delay replenishment, it is recommended that additional reserve stocks are held. Any quantity of foam concentrate carried on an appliance in excess of the amount required by Table 8.2 may be considered as part of the reserve.

5.2.2 Where more than one type of foam concentrate is held, care must be taken to ensure that all types are kept apart. The mixing of different types of foam can cause serious sludging and possible malfunctioning of appliance foam production systems. If it is necessary to change the concentrate carried on an appliance it is essential that the tank, pipework and pump (if fitted) is thoroughly cleaned prior to the new concentrate being used, or very serious damage may result.

5.3 Principal and complementary media

5.3.1 The following paragraphs must be read in conjunction with Table 8.2. They are related to principal and complementary media and discharge rates. The principal medium must be a foam which meets either performance level A or B as defined in Appendix 8E, except that at aerodromes of Special, 1, 2 and 3 categories the foam shall meet performance level B.

5.3.2 In specifying foam concentrate for contractual purposes the test procedures employed in the following UK Government Defence Standards and the minimum standards set out in Appendix 8E of this Chapter are appropriate.

Protein Foams	British Defence Standard No.42-21
Fluoroprotein foams	British Defence Standard No.42-22
Fluorochemical foams (AFFF)	British Defence Standard No.42-24

5.3.3 Table 8.2 specifies the minimum quantity of foam concentrate required for each aerodrome category based on solution strengths generally accepted for each type of foam concentrate. It will be for the licensee to satisfy himself that the foam liquid is suitable for appliances and that it is correctly metered to produce foams with the following recommended characteristics from the monitor.

5.3.3.1 **PROTEIN FOAM**
 25% Solution drainage time – approximately 11 minutes.
 Expansion ratio – between 8:1 and 12:1.

5.3.3.2 **FLUORO-CHEMICAL & FLUOROPROTEIN FOAM**
 25% Solution drainage time – approximately 6 minutes.
 Expansion ratio – not less than 6:1.

5.3.4 The complementary media is to be a combination of Dry Powder and either Halocarbon (BCF) or CO².

- 5.3.4.1 Where the main complementary medium is a dry powder there must also be a quantity of halocarbon (BCF 1211) or CO₂ with a suitable applicator for use on aircraft engine fires. The appropriate minimum amounts of halon are:

RFF Categories Special to 4 = 9 kgs
RFF Categories 5 to 9 = 50 kgs

The appropriate minimum amounts of CO₂ are:

RFF Categories Special to 4 = 18 kgs
RFF Categories 5-9 = 100 kgs

- 5.3.4.2 Where the main complementary medium is Halon 1211 or CO₂ there must also be a quantity of dry powder to assist in dealing with a running fuel fire. Where this additional quantity of dry powder is provided in hand held (minimum capacity 9 kg extinguishers) it will not be necessary to comply with the discharge rate requirement at 5.4.2

Appropriate minimum amounts of powder to be provided are:

RFF Categories Special to 4 = 9 kgs
RFF Categories 5-9 = 25 Kgs

NOTE: Paragraph 5.3.4.3 does not apply to these minimum amounts.

- 5.3.4.3 Where the dry powder 'Monnex' is used the quantity provided need only be 50% of the standard dry powder requirements. In this context a standard dry powder is one that meets I.S.O. 7202. BS.6535 Pt 3 1989.

- 5.3.4.4 Any dry powder medium provided is to be of the foam-compatible type.

- 5.3.5 At all aerodromes up to a maximum of 50% of the complementary media may be replaced by water for the production of a foam meeting performance level 'B'. For the purposes of substitution the following rates will apply:

1 kg Dry Chemical Powder or Halon = 1 litre water
2 kg Carbon Dioxide = 1 litre water

5.4 Discharge rates for complementary media

- 5.4.1 Where reference is made to complementary media the Authority will need to be satisfied that the selected medium is capable of being discharged at an effective rate, and, in the case of the medium intended for use on aircraft engine fires, is capable of delivery through equipment which will ensure its effective application.

- 5.4.2 Dry powder installations are to deliver their media through one or more applicators at a minimum discharge rate of 1.35 kg/sec. Applicators must be equipped with temporary shut-off valves.

- 5.4.3 Halon medium is to discharge at not less than 1.35 kg/sec through one or more applicators equipped with a temporary shut-off valve. It should be noted that a discharge rate of 2 kg/sec may be needed to deal with fires occurring in large aircraft engines.

- 5.4.4 The design of any complementary media installation should seek to optimise the delivery patterns of the chosen medium, offering alternative patterns of discharge as required.

Table 8.2 Minimum usable amounts of extinguishing agents

Aerodrome	Foam meeting performance Level A			Foam meeting performance Level B			Complementary Agents *		
	Water	Foam Concentrate	Discharge Rate Foam solution/minute	Water	Foam Concentrate	Discharge rate foam solution/minute	Dry powder	Halon	CO ₂
Category	(L)	(L)**	(L)	(L)	(L)**	(L)	(kg)	(kg)	(kg)
(1)	(2)	(3)	(4)	(2)	(3)	(4)	(5)	(6)	(7)
Special				90	6	60	14	14	25
1				230	14	230	45	45	90
2				670	40	550	90	90	180
3				1 200	72	900	135	135	270
4	3 600	216	2 600	2 400	144	1 800	135	135	270
5	8 100	486	4 500	5 400	324	3 000	180	180	360
6	11 800	708	6 000	7 800	474	4 000	225	225	450
7	18 200	1092	7 900	12 100	726	5 300	225	225	450
8	27 300	1638	10 800	18 200	1092	7 200	450	450	900
9	36 400	2184	13 500	24 300	1458	9 000	450	450	900

* See Paragraph 5.3. for details of foam qualities and permissible variations in the provision of Complementary media.

** These quantities are based on a 6% solution strength, which is usually suitable for appliances and equipment designed to use these foam concentrates. Suitable 3% concentrates are also acceptable.

NOTE: Dry Chemical powder and halons are normally considered more efficient than CO₂ for aircraft rescue and fire fighting operations.

6 RESPONSE TIME

- 6.1** Response time is defined as the time between the initial call to the rescue and fire fighting service and the time when the first responding vehicle(s) is (are) in position, and if required to, produce foam at a rate of at least 50% of the discharge rate specified in Table 8.2
- 6.1.1** The operational objective of the RFFS should be to achieve response times of two minutes and not exceeding three minutes, to the end of each runway, as well as to any other part of the response area in optimum visibility and surface conditions.
- 6.1.2** The response area extends to the end of each runway and all other areas of the aerodrome where aircraft park or taxi immediately prior to, or following any flight which under the Air Navigation Order is required to use a licensed aerodrome.
- 6.1.3** Guidance on measures which help to achieve and maintain a satisfactory response capability are given in Appendix 8B.
- 6.2** To meet the operational objective as nearly as possible in less than optimum conditions of visibility it may be necessary to provide guidance for rescue and fire fighting vehicles. See Appendix 8B paragraph 1.1.7.

7 APPLIANCES

- 7.1** The extinguishing media and rescue equipment at category 3-9 aerodromes are to be carried on self propelled appliances which have maximum mobility in all weather conditions on and off paved surfaces and which are able to reach any area within the aerodrome boundary. The appliances must accommodate the rescue and fire fighting personnel and sufficient vehicles are to be deployed at the scene of the incident to provide media in the quantity and at the uninterrupted rate of discharge appropriate to the category of aerodrome. In all cases the crew compartment must provide for the safe conveyance of the RFF personnel to an incident with sufficient space to facilitate the donning of protective clothing. At aerodromes of category 2 and below non self propelled appliances are permissible but they must be connected to a suitable towing vehicle whilst aircraft movements are taking place.
- 7.2** Foam tenders equipped with monitors should be able to produce foam whilst on the move at slow speeds (8-10 k/hr [3-5mph]) and at aerodromes in Categories 5-7 there must be at least two foam producing appliances with aspirating monitors to facilitate an attack on a fire from more than one point or quarter. These monitors need an effective range at least equal to the length of the longest aircraft normally using the aerodrome and the capability to deliver foam in a dispersed pattern for blanketing purposes. At aerodromes in Categories 8-9 there must be at least three foam producing appliances which meet the above criteria.
- 7.3** Where the aerodrome is licensed for night use appliances must be provided with specialised lighting equipment for adequate illumination at the scene of the accident. Mast mounted Halogen flood lights are considered to be satisfactory.
- 7.4** Aerodrome authorities should consider the provision of reserve appliances so as to maintain the appropriate level of services when any of the station's appliances are temporarily unavailable due to maintenance requirements or unserviceability. These appliances are also to comply with the requirements of Appendix 8A.
- 7.5** Automotive requirements for rescue and fire fighting appliances are set out in appendix 8A.

8 AERODROMES LOCATED ADJACENT TO WATER, SWAMPY AREAS OR OTHER DIFFICULT ENVIRONMENTS

8.1 At airports where a significant proportion of aircraft movements take place over water, swampy areas or other difficult terrain in the immediate vicinity of the airport and where conventional fire service vehicles may not be capable of effective response, the airport authority should ensure the availability of special procedures and equipment to deal with accidents which may occur in these areas. These facilities need not be located on or provided by the airport if they can be made available by off airport agencies as part of the airport emergency plan. In all cases the airport authority must determine and specify in advance the response area for which it undertakes to provide a rescue service.

On airport facilities will generally be required to cover difficult environments within a distance of 1000 metres beyond the ends of each runway.

9 MANNING OF APPLIANCES

9.1 During promulgated hours of operation and while any other movements of aircraft that require to use a licensed aerodrome are taking place, sufficient trained personnel are to be detailed and readily available to man the rescue and fire fighting vehicles and to operate the equipment at the discharge rates appropriate to the relevant RFF category. These trained personnel should be deployed in a way that ensures minimum response times can be achieved and that continuous agent application at the appropriate rate can be fully maintained. Personnel are to be trained and qualified in accordance with Section 11.

9.2 The minimum number of men to be in the immediate vicinity of the appliance to ensure instantaneous response to an emergency call should not be less than the following:

<i>Aerodrome Category</i>	<i>Minimum number of men</i>
1 (and Special)	2
2	3
3	4
4-9	See below

9.3 For aerodromes of category 4-9 the scale of manning and the minimum number of personnel required to achieve both minimum response time and the required discharge rate will be assessed by the Authority. In assessing minimum manning levels consideration will be given to type, capacity and discharge rate of appliances to be deployed, extraneous duties and other factors which may have a bearing on the response times.

9.4 Consideration will also be given to the types of aircraft using the aerodrome and the need for personnel to use handlines, ladders and other rescue and fire fighting equipment provided at the aerodrome associated with aircraft rescue and fire fighting operations.

9.5 When fire service personnel are engaged on extraneous duties they must be capable of meeting the response time from those duties. They must not be employed on fuelling duties when forming part of the minimum riders due to the hazard of fuel contaminated clothing and the safety requirements in closing down such an operation.

9.6 On a vehicle which is capable of producing foam or other media through a monitor, the role of the monitor operator must not be performed by the driver of that vehicle, other than when sidelines from that appliance are in use.

10 SELECTION OF PERSONNEL

10.1 Regard must be given to the arduous nature of rescue and fire fighting activities. Personnel selected for these duties are to be free from any physical disability which may impair their performance or which may be aggravated by prolonged exertion. Firemen must have at least average strength and have no abnormalities which could reduce their physical powers during a rescue. Any conditions liable to be induced or aggravated by smoke, dust, heat, irritants or fumes (eg. asthmas) must be considered a disqualification.

10.2 Medical Examinations

10.2.1 Personnel who are employed for rescue and fire fighting duties at Categories 3-9 aerodromes must have an initial examination before recruitment and undergo further examinations at five-yearly intervals up to the age of 40, then at two-yearly intervals up to the age of 50 and annually thereafter.

NOTE: From 1st January 1993 personnel who have reached 60 years of age will not be acceptable for employment within the Aerodrome RFFS.

10.2.2 Particular attention is paid to exercise tolerance. At the initial and subsequent medical examinations the test specified on the examination report are to be carried out and all candidates are required to pass these tests.

10.2.3 An ECG is to be carried out at the initial examination. At subsequent examinations an ECG may be carried out if the examiner considers it necessary.

10.2.4 Personnel should not be overweight. A suggested maximum is 20% above ideal weight as recommended by the Society of Actuaries. Exceptions may be made for persons of heavy muscular build.

10.2.5 The hazardous nature of the job makes most types of medication inadvisable. For example, antihistamines and tranquillisers may cause drowsiness and a slowing of reaction time. Sufferers from hay fever who use antihistamines should be assessed unfit.

10.2.6 Copies of the appropriate Medical Examination Report can be obtained from the Senior Medical Officer, Civil Aviation Authority.

10.3 Medical standards

10.3.1 Persons employed for rescue and fire fighting duties must meet the following medical standards.

(a) *General Physique*

Candidates should be of good general muscular development, with no marked obesity. They should be not less than 1.67 m in height. They must be fit for any manual work, including lifting, climbing and all fire service duties, and the use of breathing apparatus where appropriate.

(b) *Upper limbs*

Muscle power average. Able to do heavy manual work. Any disability must be so slight that it does not interfere with the ability to handle tools or do heavy manual work.

(c) *Locomotion*

Capable of running, climbing ladders, jumping, crawling and performing all kinds of manual labour under conditions expected at a fire.

(d) *Hearing*

Ability to hear sufficiently well under adverse circumstances is essential. Forced whisper to be heard in each ear separately at 6m. In cases of doubt an audiometer test is advisable.

(e) *Vision*

The following minimum standards apply:

- (i) Distance visual acuity should not be less than 6/12 in one eye and 6/36 in the other, with glasses if necessary, and not less than 6/18 with both eyes unaided.
- (ii) Where spectacles are required to achieve the above standard, for operational duties they should be of a safety type approved by the Authority.
- (iii) The use of contact lenses is not permitted.
- (iv) Colour perception should be normal on initial testing by Ishihara plates. If a defect is found during the examination, a further test is to be carried out using a suitable lantern to demonstrate the ability to distinguish the signal colour, red, green and white.
- (v) Where firefighter's duties require the holding of a Heavy Goods Vehicle Licence (HGV) the appropriate DVLC standards and examination recommendations will apply.

(f) *Mental capacity*

Normal. Able to perform all duties successfully.

(g) *Emotional stability*

Emotionally fit to perform fire service duties adequately under operational conditions.

10.3.2 *Disqualifications*

10.3.2.1 The following disabilities render a person unsuitable for operational fire service duties:

- (a) History of epilepsy, gastric or duodenal ulcer or mental instability.
- (b) Hearing in either ear less than 6 m for ordinary conversational voice or any evidence of labyrinthine disturbance.
- * (c) Patent perforation of one or both ears, otitis media, or gross nasal sepsis or obstruction. Healthy perforation of one or other ear drum may be acceptable provided there is no serious hearing loss or chronic discharge.

* The conditions marked with an asterisk may be susceptible to remedial treatment.

- *(d) Hernia or hydrocele.
- *(e) Serious varicose veins giving rise to symptoms.
- *(f) Serious chronic skin disease.
- (g) Chronic bronchitis or asthma or other disabling disease of the lungs.
- (h) Organic disease of the cardiovascular system.
- (i) Albuminuria, unless shown to be simple orthostatic with proof of normal renal function.
- (j) Personnel with glycosuria should normally be rejected, but if they are able to furnish satisfactory evidence of normal sugar metabolism (eg. from a hospital, clinic or specialist) they may be accepted.
- (k) Organic nervous disorder of any kind, a history of vertigo or any condition which would impair a candidate's sense of balance.
- *(l) Significant obesity.

11 TRAINING

11.1 General

- 11.1.1 All personnel involved in rescue and fire fighting duties must receive appropriate specialist training. Achievement of the required standard will be recognised by the issue of a Certificate of Competence. At Category Special, 1 and 2 aerodromes all personnel on duty must be qualified at the appropriate level. At Category 3-9 aerodromes at least 75% of personnel on duty, including officers, must be qualified at the appropriate levels. This will allow flexibility in the employment of new recruits and those awaiting revalidation courses. The appropriate levels of qualification are set out in paragraph 11.2 below. All personnel must receive appropriate regular training in First Aid. Where necessary personnel must also be in possession of a current Heavy Goods Vehicle driving licence.
- 11.1.2 At Aerodromes of Special, 1 and Category 2 the training may be carried out by either an officer employed at the Aerodrome who holds a current Junior Officer (Lower Category Aerodromes) Certificate of Competence, or by any other officer who holds a current CAA Certificate of Competence to at least Leading Fireman level.
- 11.1.3 All personnel employed on RFF duties at aerodromes of Categories 3-9 are to be trained at a Fire Service Training School approved by the Civil Aviation Authority. Persons presenting themselves at a Fire Service Training School must have been medically examined and found fit in accordance with paragraph 10 above.
- 11.1.4 Certificates of Competence issued by the Authority after training at a Fire Service Training School are valid as follows:
 - (a) Junior Officer (Low Category Aerodromes) – Three Years

* The conditions marked with an asterisk may be susceptible to remedial treatment.

- (b) Basic, Firemanship and Leading Fireman – Five Years
 - (c) Junior Officer, Officer – Five Years
 - (d) Senior Officer – Three Years
- 11.1.5 Certificates of Competence are revalidated by examination after further CAA approved training.
- 11.1.6 Certificates of Competence after CAA approved local training are valid for 18 months.
- 11.2 Personnel are to hold a Certificate of Competence approved by the Authority in accordance with the following scale:
- 11.2.1 *Special and Category 1 aerodromes* All RFFS personnel on duty are to hold a Certificate of Competence after having undergone training in accordance with procedures agreed with Aerodrome Standards Division Fire Service Branch.
- 11.2.2 *Category 2 aerodromes* The duty Officer-in-Charge of the RFFS is to hold a Junior Officer (Lower Category Aerodromes) Certificate of Competence. All crew members on duty are to hold a Certificate of Competence.
- 11.2.3 *Category 3 aerodromes* The duty Officer-in-Charge of the RFFS is to hold a Junior Officer Certificate of Competence. It is recommended that the duty Officer-in-Charge also holds the minimum rank of Sub Officer.
- 11.2.4 *Categories 4 and 5 aerodromes* The Officer-in-Charge of the RFFS is to hold a Certificate of Competence as an Aerodrome Fire Officer Grade 2. It is recommended that the Officer-in-Charge also holds the rank of Station Officer. In addition, sufficient watchkeeping officers are to be qualified as Junior Officer to provide one qualified officer on duty when the Aerodrome is open for use. It is recommended that the watchkeeping Officer also holds the rank of Sub Officer.
- 11.2.5 *Category 6–9 aerodromes* The Officer in charge of the RFFS is to hold a Certificate of Competence as an Aerodrome Fire Officer Grade 1. It is recommended that the Officer-in-Charge also holds the minimum rank of Assistant Divisional Fire Officer. Sufficient watchkeeping officers are to be qualified as Aerodrome Fire Officer Grade 2 to provide one qualified officer on duty when the Aerodrome is open for use. It is recommended that the duty watchkeeping officer also holds the minimum rank of Station Officer.
- 11.3 Local aerodrome training
- 11.3.1 In addition to attendance at a course at a central training establishment, approved for the purpose by the Authority, personnel must be given regular comprehensive training at their own aerodromes to ensure the efficient use of the appliances and equipment. This training should include dealing with hazardous chemicals, radiological risks and decontamination procedures where appropriate. Aircraft familiarisation must form an integral part of local training, methods of door operation, seat removal and location and type of escape slides are important aspects of such training. Records, on a personal basis, of all practical and technical instruction are to be maintained.
- 11.3.2 Advice on the composition of training programmes and the conduct of training may be obtained from the Aerodrome Standards Division (Fire Service Branch).

11.4 Breathing apparatus training

11.4.1 At Categories 3–9 aerodromes all RFF personnel are required to be trained and competent in the use of breathing apparatus. Adequate arrangements are to be made to ensure that all breathing apparatus wearers receive regular practical training in an environment that simulates conditions likely to be encountered during a fire situation within an aircraft fuselage. All wearers should undergo training in both heat and smoke no less than once in each six month period. This training should be under the supervision of a qualified breathing apparatus instructor.

11.5 Aircraft emergency diagrams

11.5.1 Aircraft emergency diagrams showing normal and emergency exits, escape slide stowage and the siting of emergency equipment, are obtainable from aircraft operators. It is important to obtain these diagrams since they contain variations from the standard configuration which may have been introduced by individual companies.

11.5.2 A further aid, in the form of 'Aircraft Information Cards' relating to the types of aircraft using the aerodrome can be produced locally. These should be of a handy size which can conveniently be stowed in a pocket in appliance cabs. The type of reference data likely to be useful includes:

- (a) location and method of operation of doors and emergency exits;
- (b) height of door sill;
- (c) length of fuselage and wing span;
- (d) type of fuel, fuel capacity, tank type and disposition;
- (e) type of engine and details of fire access panels (where fitted);
- (f) Seating accommodation.

12 RESCUE EQUIPMENT

12.1 The scale of rescue equipment is to be that shown in Table 8.3

12.2 Respiratory protection equipment for aircraft rescue and fire fighting operations

12.2.1 Experience has shown the need for respiratory protection both outside the aircraft and for personnel required to enter an aircraft during rescue and fire fighting operations. At aerodromes Category 3–9 breathing apparatus together with the necessary safety equipment and spare cylinder for each set is to be provided in accordance with Table 8.3. The equipment and spare charged cylinders must be carried on one or more of the appliances responding to an incident.

12.2.2 The function of breathing apparatus is to enable the wearer to work in an atmosphere which would not otherwise support life. Respiratory protection can be provided by self-contained breathing apparatus which will enable the wearer to enter irrespirable atmospheres in safety and work in them. The type recommended is that most commonly used i.e. the compressed air set (positive pressure). Each set is to be fitted with distress unit, B A Tally, pouch complete with personal line and a safety torch. An appropriate control board is to be provided.

Table 8.3 Minimum quantities of rescue equipment

RESCUE EQUIPMENT Item	Aerodrome Category						
	Special Reqd	1 & 2 Reqd	3 & 4 Reqd	5 & 6 Reqd	7 & 8 Reqd	9 Reqd	
Axe rescue large non-wedging type	-	-	1	1	1	1	
Axe rescue small non-wedging/aircraft type	1	1	1	1	1	1	
Cropper bolt 61cm	1	1	1	1	1	1	
Crowbar 1m	1	1	1	1	1	1	
Crowbar 1.8m	-	-	-	1	1	1	
Chisel cold 25mm	-	-	1	1	1	1	
Hammer 1.8kg	-	-	1	1	1	1	
Hammer 6.35kg	-	-	-	-	1	1	
Hook grab or salving	-	1	1	1	1	1	
Hacksaw heavy duty c/w 6 blades	-	1	1	1	1	1	
Blanket fire resisting	1	1	1	1	1	1	
Ladder extending to 5.5 metres	-	1	2	2	3	3	
Ladder extending to 10.5metres	-	-	-	1**	1**	1**	
Line 50mm x15m	-	1	1	1	1	1	
Line 50mm x 30m	-	-	-	1	1	1	
Pliers 17cm side cutting pairs	1	1	1	1	1	1	
Saw double edged/ general purpose	-	1	1	1	1	1	
Screwdrivers slotted and Phillips assorted set	1	1	1	1	1	1	
High Viz Surcoat for O.I.C	-	-	1	1	1	1	
Snippers tin	1	1	1	2	4	4	
Powered rescue saw with one spare blade	-	-	-	1	1	1	
Pneumatic rescue chisel plus spare cylinder chisel and retaining spring	-	-	-	1	1	1	
Knives quick release c/w sheath#	1	1	4	6	8	8	
Gloves flame resisting pairs#	2	2	3	4	8	8	
Breathing Apparatus and cylinders	-	-	2	4	6	8	
Spare cylinders	-	-	2	4	6	8	
Loud Hailer	-	-	1	1	1	1	

**It may be appropriate to substitute one or more of the ladders with elevating platforms. The level of any substitution should be discussed with the Directorate of Aerodromes Standards (Fire Service Branch). # Appliance equipment unless issued to individual crew members.

12.2.3 General guidance on breathing apparatus and its operational use is set out in the Manual of Firemanship Book 6 'Breathing Apparatus and Resuscitation' issued under the authority of the Home Office (Fire Department) and published by HMSO.

12.2.4 It is essential for users to have a thorough knowledge of breathing apparatus and its capacity, and for adequate safeguards to be provided when the equipment is in use. Wearers must be fully conversant with the operational procedures laid down by the Central Fire Brigades Advisory Council and as detailed in Technical Bulletin 1/89.

13 PERSONAL EQUIPMENT FOR RESCUE AND FIRE FIGHTING PERSONNEL

13.1 Personnel must be equipped with suitable protective clothing for the full range of practical operations to give protection against radiated heat without restricting the mobility and endurance of the wearer. In addition, the Officer-in-Charge must at all times when involved in an incident wear a distinctive high visibility waistcoat or other distinctive markings. Hand lamps, and appropriate portable lighting equipment should be provided at aerodromes licensed for night use.

13.2 Protective clothing for aircraft rescue and fire fighting operations

13.2.1 All rescue and fire fighting personnel must be provided with helmets and visors, fire tunics, trousers, gloves and boots. At Special and Category 1 and 2 aerodromes fire tunics and fire boots may be substituted by other suitable fire resisting/safety clothing in consultation with CAA Fire Service Branch.

13.3 Protective clothing for special risks

13.3.1 At aerodromes where transportation of hazardous freight is known to be undertaken the RFFS personnel should be provided with suitable protective clothing, including where necessary breathing apparatus to enable them to deal safely with any incident that may occur. Hazardous freight includes hazardous chemicals and radioactive material.

14 RADIO COMMUNICATIONS

14.1 Radio communications are essential for the swift and accurate transmission of calls to respond to an emergency and for the control and co-ordination of all subsequent rescue and fire fighting activities. At all aerodromes where air/ground facilities are provided all fire and rescue vehicles should be provided with radio/telephone equipment.

14.2 Where more than one aerodrome fire appliance has radio equipment there should be two-way communication between these appliances.

14.3 The equipment provided on fire appliances may be in fixed or portable form and should have an effective range which will ensure reception within the aerodrome. Where the operating procedures of the Rescue and Fire Fighting Service include an off-aerodrome response commitment, the range of the equipment should have regard to this commitment.

14.4 Where the deployment of personnel and appliances for non-fire service duties may entail entry to buildings, aircraft or aerodrome installations, additional portable communications equipment may be required to ensure that the response capability is maintained.

14.5 At aerodromes Category 5-9 vehicle mounted/portable radio facilities to enable the airport Fire Officer to communicate with the aircraft flight deck whilst the aircraft is on the ground are to be provided. This is to be achieved via the 121.6 channel. It is recommended that a recording facility for this specific frequency be provided.

14.6 At aerodromes Category 5-9 radio facilities to enable the airport fire service to communicate with responding local authority fire services are required.

15 INSPECTION AND TESTING OF APPLIANCES AND EQUIPMENT

15.1 All appliances and equipment must be maintained in a serviceable condition to ensure their availability and effective use in an emergency. A record is to be maintained of all tests and inspections and this should include consequential action when an inspection has revealed a defect or a deficiency.

15.2 The intervals between inspections and tests specified in the Fire Service Drill Book are regarded as maxima and tests may be applied more frequently where equipment is used extensively or as may be specified in local instructions. Particular attention should be paid to the instructions published by the manufacturers in respect of maintenance and inspection of equipment. Guidance on inspection testing and maintenance of equipment is set out in Part III of the Fire Service Drill Book issued under the authority of the Home Office (Fire Department) and published by HMSO.

16 EMERGENCY ORDERS

16.1 Emergency Orders, which form part of the Aerodrome Manual, must include arrangements for alerting the Rescue and Fire Fighting Service, for the notification of other aerodrome sections and for summoning externally based emergency services. These Orders must detail procedures for all emergency situations in which the Rescue and Fire Fighting Service is likely to become involved, including where appropriate, off-aerodrome attendances, inshore rescue operations, chemical and radiological incidents.

16.2 At aerodromes where the RFFS category is 3 or higher the emergency orders must be tested by conducting:

(a) a full scale aerodrome emergency exercise at intervals not exceeding two years, AND

(b) partial emergency exercises in the intervening year to ensure that any deficiencies found during the full scale emergency exercise have been reviewed and or corrected.

16.2.1 It may not be necessary for aerodromes to hold a full scale emergency exercise during any year in which they experience a major aircraft incident which involves all nominated supporting emergency services and agencies.

16.2.2 It will however be a requirement for an exercise to be held as soon as practicable and in any event within 12 months to ensure that any deficiencies found during the major aircraft incident have been reviewed and or corrected as appropriate.

16.2.3 The purpose of a full scale exercise is to ensure the adequacy of the plan to cope with different types of emergencies. This exercise must invite the attendance of all externally based emergency and support units services. Where aerodromes are licensed for night use alternate full scale exercises are to be held during the hours of darkness.

- 16.2.4 The purpose of the partial exercise is to ensure the adequacy of the response to individual participating agencies and components of the plan, such as the communications system or casualty evacuation.

Where aerodromes are licensed for night use and or when support included within the emergency orders varies according to the day or time, the holding of the exercise should be varied so that all likely prevailing conditions are tested over a limited period.

- 16.3 Guidance on the scope, format and distribution of Emergency Orders is contained in the CAA Document CAP 174.

- 16.4 Category 3-9 aerodromes will, prior to initial licensing, be required to hold a satisfactory operational exercise involving local emergency and supporting services.

- 16.5 At lower category aerodromes the Authority will, prior to initial licensing be required to be satisfied that off aerodrome emergency services are familiar with the emergency procedures and the topography of the aerodrome.

17 INSPECTIONS

- 17.1 The Authority's Inspectors will aim to inspect the Rescue and Fire Fighting Service at licensed aerodromes at least once per year. These inspections may be conducted without prior warning to the licensee.

- 17.2 The Authority's Inspectors will need to be satisfied that the Rescue and Fire Fighting Service is operating as an effective unit and will require to see evidence that the licensee has made a full assessment of the operational requirements and that the necessary procedures and practices have been introduced. The licensee may be required by the Inspector to provide a full scale demonstration to establish the effectiveness of any element of the emergency arrangements. When this is called for, prevailing operational conditions will be taken into account.

- 17.3 The Authority's Inspectors will wish to see documentary evidence relating to the qualifications of personnel employed for rescue and fire fighting duties, including the appropriate Certificates of Competence and medical certification. They will wish to examine the records of local training and evidence of exercises, including those with other emergency services. Records of the inspections, tests and maintenance of all equipment and appliances used by the Rescue and Fire Fighting Service should be available for examination.

APPENDIX 8A RESCUE AND FIRE FIGHTING APPLIANCE AUTOMOTIVE REQUIREMENTS

Appliances should be capable of carrying their full load with maximum traction and mobility on and off paved surfaces in all reasonable weather conditions and have the ability to operate over all types of terrain on or around the aerodrome at speeds up to 24 km/h (15 mph).

1 MAJOR FOAM TENDERS

1.1 At their full operational weight on a dry level paved surface major foam tenders should have the following minimum characteristics:-

1.1.1 *Acceleration:* 80km/h (50 mph) within 40 seconds at normal operating temperature.

1.1.2 *Top speed:* At least 100 km/h (62 mph).

1.1.3 All-wheel drive capability

1.1.4 Automatic or semi-automatic transmission.

1.2 Clearance

1.2.1 Ground clearance must be sufficient to permit full mobility during 'off the road' conditions. The minimum acceptable clearance and angles are:

Angle of Approach	30 degrees
Angle of Departure	30 degrees
Under chassis clearance	14 inches

1.3 Weight

1.3.1 The full operational weight of appliances must not exceed the axle manufacturer's certified load ratings permitted for unpaved surface operations.

1.3.2 The centre of gravity of the vehicle should be kept as low as possible and at its full operational weight the vehicle should pass a static tilt test of not less than 28 degrees platform tilt right and left with not more than 33 degrees chassis tilt.

1.4 With the exception of pressurised or pre-mixed appliances the amount of foam concentrate carried should be sufficient to supply at least two full loads of water tank capacity.

1.5 The monitor, which must be of an aspirating type should have a range appropriate to the longest aircraft operating at the aerodromes; attention is drawn to the advisability of having both a high and low discharge capability on the larger monitors.

1.6 The option of having the monitor operable by the driver and/or a monitor operator exists but in considering this, due regard must be paid to Chapter 8, paragraph 9.6.

1.7 The option of under-vehicle protection is available but any media used for this purpose shall be in addition to minimum amounts of media required for the relevant category of aerodrome.

1.8 Wheels and tyres

- 1.8.1 Each tyre at the specified minimum inflation pressure is to have a certified weight-carrying capacity at least equal to the gross load normally imposed on it by the evenly and fully loaded appliance.
- 1.8.2 Tyres are to be of the same size and interchangeable. Twin rear wheels are not acceptable.
- 1.8.3 Cross-ply or radial-ply tyres may be fitted but they must not be mixed. The tread pattern should be suitable for the particular terrain on or around the aerodrome where the appliance is likely to have to operate.
- 1.8.4 Tyre pressures should be clearly shown on the side of the appliance and should be the lowest possible consistent with the tyre manufacturer's certified load and speed ratings.

2 RAPID INTERVENTION VEHICLES

- 2.1 The main functions of the RIV are to reach accident sites quickly, carrying personnel able to initiate rescue action and to provide an effective means of fire suppression pending the arrival of the major units. It should be capable of crossing adverse terrain where access for the major units may be slow or difficult.
- 2.2 The design should combine speed, acceleration, flotation, traction and manoeuvrability as far as possible, bearing in mind these characteristics are not necessarily compatible. Speed and acceleration are considered to have preference at most aerodromes.
- 2.3 The requirement will be for the vehicle to carry an effective quantity of primary extinguishing media appropriate to the airfield category. The vehicle should also carry a quantity of complementary media.
- 2.4 The vehicle may also carry the rescue, lighting and miscellaneous equipment but due regard must be paid to the weight and performance characteristics of the chosen chassis.
- 2.5 **Minimum characteristics**
 - 2.5.1 At the full operational weight on a dry level paved surface the RIV should have the following minimum characteristics:
 - 2.5.1.1 *Acceleration:* 80 km/h (50 mph) within 25 seconds at normal operating temperature.
 - 2.5.1.2 *Top speed:* At least 105 km/h (65 mph)
 - 2.5.1.3 All-wheel drive capability.
- 2.6 At Categories 4–9 aerodromes, if an RIV is required to satisfy licensing conditions the appliance is to be provided with a suitable aspirating monitor.
- 2.7 **Weight**
 - 2.7.1 The full operational weight of appliances must not exceed the axle manufacturer's certified load ratings permitted for unpaved surface operations.

- 2.7.2 The centre of gravity of the vehicle should be kept as low as possible and at its full operational weight the vehicle should pass a static tilt test of not less than 28 degrees platform tilt right and left with not more than 33 degrees chassis tilt.
- 2.8 **Wheels and tyres**
 - 2.8.1 Each tyre at the specified minimum inflation pressure is to have a certified weight carrying capacity at least equal to the gross load normally imposed on it by the evenly and fully loaded appliance.
 - 2.8.2 Tyres are to be of the same size and interchangeable. Twin rear wheels are not acceptable.
 - 2.8.3 Cross-ply or radial-ply tyres may be fitted but they must not be mixed. The tread pattern should be suitable for the particular terrain on or around the aerodrome where the appliance is likely to have to operate.
 - 2.8.4 Tyre pressures should be clearly shown on the side of the appliance and should be the lowest possible consistent with the tyre manufacturer's certified load and speed ratings.

APPENDIX 8B THE DEVELOPMENT OF OPERATIONAL PROCEDURES TO MAINTAIN RESPONSE CAPABILITY IN ALL NORMAL CONDITIONS

- 1 The following material has been prepared to identify the principal areas in which it will be necessary to develop operational procedures and training to maintain acceptable response times in all conditions of weather, surface and traffic state which may be encountered during the hours of aerodrome availability. In these considerations account should be taken of possible interference with the functioning of rescue and fire fighting appliances and the crews. The weather and associated surface conditions, particularly fog, snow, ice and heavy rain, and the traffic on runways, taxiways and roads which may be used or crossed by responding appliances may all have their effect. The aim should be to achieve the best possible response times by anticipating the conditions likely to impede progress and devising and practising procedures which will minimise delays from these causes.
 - 1.1 Some procedures which should be considered are:
 - 1.1.1 Regular familiarisation with the aerodrome so that drivers can recognise landmarks and have opportunities to operate vehicles over all types of terrain during all kinds of weather.
 - 1.1.2 The use in the training programme of vehicles other than the rescue and fire fighting appliances provided they are radio controlled and have similar operating characteristics.
 - 1.1.3 Selection of the best routes to any point on the aerodrome and the development of the use of grid maps as an aid when responding to an aircraft accident.
 - 1.1.4 Development of procedures with air traffic control to provide information on the location of an accident and the position of other aircraft or vehicles on the aerodrome which may obstruct or impair the fire vehicle movements.
 - 1.1.5 Development of procedures for the promulgation of information which will allow the selection of alternate routes to any point on the aerodrome when the normal routes are blocked.
 - 1.1.6 Development of procedures which will place the rescue and fire fighting personnel on standby alert when the aerodrome visibility has deteriorated below a predetermined level established by the licensee.
 - 1.1.7 Development of procedures in conjunction with air traffic control for operation in low visibility conditions using all means of guidance available on the aerodrome. These may include selective switching of taxiway lighting, provision of adhesive reflectors between fire stations and lit taxiways, and the use of aerodrome surface movement radar.
 - 1.1.8 Development and regular testing of procedures which ensure that personnel engaged on duties away from the fire station can be alerted and are able to achieve the minimum response times with the appliances in accordance with paragraph 6.

2 STANDBY POSITIONS

- 2.1 If response time is likely to be seriously affected, it will be necessary to consider pre-positioning of rescue and fire fighting vehicles at suitable places on the movement area. When such a procedure is adopted the location of the rescue and fire fighting vehicles must not:

- (a) interfere with or disrupt the operation of aerodrome navigation aids;
- (b) be closer to an active runway than the taxi-holding positions in use at the time;
- (c) increase response time to other response areas on the aerodrome.

2.2 A source of electrical power at standby positions may be necessary to provide heating or cooling and maintain radio communications.

3 EMERGENCY ACCESS ROADS

- 3.1 Depending on the location of the aerodrome and its topography consideration should be given to the provision of emergency access roads to various areas on the aerodrome and to areas beyond the aerodrome boundary for as far as is practicable. Particular attention is required to the provision of ready access to overshoot and undershoot areas up to 1000m from the thresholds.
- 3.2 Emergency access roads should be usable in all weather conditions and by the heaviest vehicles likely to use them. Roads within 90 m of the runway should be surfaced to prevent surface erosion and the transfer of debris to the runway. Sufficient vertical clearance should be provided from overhead obstructions for the largest vehicles.
- 3.3 When the surface of the road is indistinguishable from the surrounding area, or in areas where snow may obscure the roads, edge markers should be placed at intervals of about 10 m.
- 3.4 Aerodrome service roads may serve as emergency access roads when they are suitably located and constructed.
- 3.5 It is recognised that there will be a requirement to reconcile the conflict of interest which may arise between the need for a controlled perimeter for aerodrome security reasons and any arrangements made for the Rescue and Fire Fighting Services and other emergency units to leave the aerodrome through emergency exit gates where off-aerodrome accidents are to be attended.

APPENDIX 8C AERODROME FIRE STATIONS

- 1 In considering the location of a fire station and its primary function other factors may have to be taken into consideration, such as the need to deal with structural fires, but these are of secondary importance and must be subordinate to the primary requirement. At large aerodromes it may be necessary to consider the provision of more than one station each located strategically in relation to the runway pattern. Experience and aircraft accident studies have shown that a large proportion of aircraft accidents occur on or close to runways, and sites for fire stations that will give the shortest response time to these areas are essential. Where more than one station is provided each may contain one or more vehicles from the total fleet, thus dividing the overall quantity of extinguishing media available into units capable of initiating fire suppression on arrival at the accident.
- 2 Costly alterations and additions to aerodrome fire stations have often been necessary because insufficient thought had been given to the weight and overall dimensions of appliances. Floors must be strong enough to bear the weight of fully laden appliances for long periods and should not be damaged when the vehicles are driven away rapidly.
- 3 Doorways must be wide enough to enable drivers to make a quick and safe exit with their appliances, and give clearance to ladders, obstruction lights and aerials etc which are fitted to vehicle roofs. Where electronically operated appliance bay doors are installed these should fully open within 15 seconds of initial operation. The bays must provide sufficient room for crews to walk around appliances and gain easy access to equipment lockers and cabs. Ceilings should be high enough to permit access to the tops of appliances so that inspections of foam tanks etc. can be carried out. It has been found preferable to provide all the accommodation on one level but at the same time allowances should be made for future expansion.
- 4 Access to the appliance bays from the rear will help the movement of appliances by providing a drive-through-capability. The parking of appliances must ensure that failure of any one shall not prevent the others from making an immediate response.
- 5 There must be a central point for receiving emergency calls and for the mobilisation of resources for emergency operations. For this purpose a watch room should be sited in a position overlooking as much of the aerodrome as possible. If an elevated structure is built and the watch room attendant is part of the turn-out crew it must be remembered that he will require quick and ready access to the appliance bays. Double glazing and other soundproofing measures may be necessary to exclude excessive noise from aircraft which may interfere with telephone and radio communications.
- 6 Facilities should be provided for varying lighting intensity in the watch room to permit some degree of external vision when the aerodrome is in use at night.
- 7 Where an air traffic service is provided at an aerodrome a direct telephone line must be provided to the watch room, and where possible, installation of a direct line to the local authority fire brigade should be provided.
- 8 The station alarms must be sited so that they are audible in all parts of the station and its environs in high ambient noise levels.
- 9 Provision must also be made for sounding a general alarm to alert those personnel who have a duty to perform in the event of an aircraft accident.

- 10 Appliance engine heaters are essential and provision for suitable plug-in points and some form of space heating should be made in appliance rooms. Appliance engines should be maintained at a sufficient temperature to ensure their immediate response capability.
- 11 More detailed advice on the design and siting of aerodrome fire stations may be obtained from the Aerodrome Standards Division (Fire Service Branch).

APPENDIX 8D THE PROVISION OF ADDITIONAL WATER FOR USE IN FIRE FIGHTING OPERATIONS FOLLOWING AN AIRCRAFT ACCIDENT

- 1 It is considered impractical to require aerodrome authorities to provide quantities of extinguishing media to deal with the worst situation that may arise using only the appliances located on the aerodrome, hence the requirement for aerodrome emergency plans to contain instructions for summoning support from externally-based fire services following an emergency. It is not easy to specify an operational requirement which makes adequate provision in all circumstances. With a response time to an accident not exceeding three minutes and the ability to discharge appliances in about two minutes it is clear that a need for additional water may arise in as little as five minutes although in this time the initial fire situation should be greatly reduced. If total extinction has not been achieved the fire can quickly extend and the appliances must be replenished.
- 2 Aerodromes should consider providing additional water as a support facility. There may be exceptions where aerodromes have adequate piped, stored or natural water supplies, provided that these are available at an accident in sufficient quantity and in time to meet the operational requirement.
- 3 At Aerodromes categories 5 – 9 the aim should be to provide at the earliest possible time a potential flow of 4540 litres per minute for a minimum period of 30 minutes at the scene of any aircraft incident occurring on the aerodrome.
- 4 In each case the aerodrome authority should consult closely with the Chief Fire Officer of the Local Authority Fire Service regarding response and supply of additional water supplies. The aerodrome authority will need to assess the suitability of the water resources which can be mobilised to support the aerodrome fire service when a serious and prolonged post-accident fire occurs. In this consideration, the speed of mobilisation and the rate at which the water can be delivered to the accident site are important factors.
- 5 The options for providing additional water may include all or some of the following:-
 - (a) Additional vehicle-borne water on the aerodrome.
 - (b) A system which provides for the rapid replenishment of the appliances used in the initial attack.
 - (c) The development of a plan with the externally-based fire service which will provide support by appliances carrying water and/or equipped to deliver water from suitable aerodrome or local sources.
 - (d) The provision of hydrants located towards the end of and adjacent to operational runways.
 - (e) The provision of static water tanks located towards the end of and adjacent to operational runways. Where these are provided, hardstanding to permit access for fire appliances together with a suitable facility to enable a pump to be set into the water supply will be required.
 - (f) The provision of overhead static water tanks to facilitate rapid replenishment of aerodrome foam tenders.

6

At some aerodromes, more particularly those located in rural areas, the response from the local authority fire service may be limited, slow to develop into an effective operational force, and may consist of appliances without a significant quantity of water. Some time must elapse before the crews of these appliances can set-in to water sources on the aerodrome and establish hoselines to where the water is required. Furthermore, the amount of water delivered will be subject to the suitability of the source and the hydraulic losses imposed by extended hoselines. From this it will be obvious that the true value of supporting facilities intended to deliver water at the accident site must be tested by operational exercises. Further advice on this matter may be obtained from the Aerodrome Standards Department (Fire Service Branch).

APPENDIX 8E FOAM PERFORMANCE LEVELS, SPECIFICATIONS AND TEST PROCEDURES

1 Foam concentrate amounts listed under Table 8.2 are required to meet the following specifications and also meet either Performance Level A or Performance Level B. The performance level will be determined by carrying out either of the tests described in paragraph 3 below. Foam concentrates which fail to meet performance level A will not be acceptable for use at licensed aerodromes.

1.1 The following specifications are provided for the guidance of manufacturers and suppliers of foam concentrates. Aerodrome Authorities should ensure that suppliers of foam concentrates provide a certificate of assurance to the effect that the concentrate supplied meets both the relevant Defence Standard as stated at 5.3.2 of Chapter 8 and the requirements of this Appendix.

2 **SPECIFICATIONS**

pH Value: pH value is a measurement to express the acidity or alkaline properties of a liquid. Therefore, in order to prevent the corrosion of plumbing of the foam tanks of a rescue and fire fighting vehicle, the foam concentrate should be as neutral as possible. The pH value of the foam concentrate is to be determined using a suitable meter and a glass electrode and should register between the values of 6 and 8.5.

Viscosity: The viscosity of a foam concentrate is an indication of the resistance to flow of the liquid in the plumbing of a rescue and fire fighting vehicle, and its consequential entry into the water system. The viscosity measurement of a foam concentrate when at its lowest temperature should not exceed 200 mm/s. Any higher registration will restrict flow and retard its adequate blending into the water stream unless special precautions are taken.

Sedimentation: Sediment may form in a foam which contains impurities or if it is subjected to adverse storage, severe weather conditions and/or varying temperatures. The resultant creation of sediment may affect the performance of a vehicle's foam proportioning system or negate its fire fighting efficiency. A representative sample of the concentrate should be transferred to a graduated centrifuge tube and centrifuged until any sediment present forms a compact deposit of constant volume. The volume of the deposit should be determined and recorded as a percentage of the foam concentrate in the tube. This value should not exceed 0.5% of sediment by volume.

3 **FIRE TESTS**

Prior to carrying out the fire tests the properties of the foam concentrate should be determined.

3.1	<i>Performance Level Type A</i>	<i>Performance Level Type B</i>
Nozzle (air aspirated)		
(a) Branch pipe	'UNI 86' foam nozzle	'UNI 86' foam nozzle
(b) Nozzle pressure (kPa)	700 (7 Bar)	700 (7 Bar)
(c) Application rate (L/min/m ²)	4.1	2.5
(d) Discharge rate (L/min)	11.4	11.4

		<i>Performance Level Type A</i>	<i>Performance Level Type B</i>
3.2	Fire Size	= 2.8m ² (circular)	= 4.5m ² (circular)
3.3	Fuel (on water substrate)	Kerosene	Kerosene
3.4	Preburn time (s)	60	60
3.5	Fire performance		
	(a) extinguishing time(s)	<60	<60
	(b) total application time(s)	120	120
	(c) 25% re-ignition time (mins)	>5 min	>5 min

4 FIRE TEST METHOD

Principle :

To evaluate the ability of a foam concentrate to:-

- (a) Extinguish a fire of 2.8m² or 4.5m² as appropriate
- (b) Resist burn back due to exposure to fuel and heat.

Equipment:

- (a) A circular fire steel tray of 2.8m² or 4.5m². The vertical wall shall be 200 mm.
- (b) Equipment or access to facilities to enable accurate recordings of:
 - (1) air temperature
 - (2) water temperature
 - (3) wind velocity
- (c) *Fuel:* 100 L of AV tur (Jet A1) for performance level type B tests;
60 L of AV tur (Jet A1) for performance level type A tests.
- (d) Branch pipe, straight stream, air aspirating nozzle
- (e) Suitable stop watch
- (f) Circular, burn back pot, measuring 300mm (internal diameter), 200 mm high, 2 L of gasoline or kerosene.

Preferable conditions:

- | | | |
|----------------------------------|-------|-------|
| (a) Air temperature °C | > 15° | > 15° |
| (b) Foam solution temperature °C | > 15° | > 15° |
| (c) Wind velocity (m/s) | < 3 | < 3 |

5 TEST PROCEDURE

Position the chamber holding the premix foam upwind of the fire with the nozzle horizontal at a height of 1 m above the upper edge of the tray and at a distance that will ensure that the foam will fall into the centre of the tray. The branch may be moved on a horizontal plane during the test.

Test the foam apparatus to ensure:

- nozzle pressure
- discharge rate

When testing performance level Type B foam, place 100L of water and 100 L of fuel into a 4.5m² tray

When testing performance level Type A foam, place 60L of water and 60L of fuel into a 2.8m² tray.

Ignite fuel and allow 60 seconds preburn from full involvement.

Apply foam continuously while maintaining a nozzle pressure of 700 KPa (7 Bar) for 120 seconds.

Record extinction time

Place burn back pot in centre of fire tray

Ignite burn back pot 120 seconds after end of application of foam

Record when 25 per cent of the fuel area is re-involved with fire.

6 CERTIFICATE OF ASSURANCE

Aerodromes should ensure that a Certificate of Assurance is obtained from the foam suppliers with regard to the concentrates relevant performance standard.

The Authority's Fire Service Inspectors will require to examine such a Certificate of Assurance from time to time.



TRAINING NOTE NO 16

THE REQUIREMENTS FOR RESCUE AND FIRE FIGHTING FACILITIES AT LICENSED AERODROMES WITHIN THE UNITED KINGDOM

INTRODUCTION

This note is provided to assist students with their studies whilst attending courses at The Fire Service Training School.

It seeks to explain the background to the requirements and to put into everyday language some of the terms used in Legislation and other explanatory documents.

For application on the Aerodrome this note should be read in conjunction with the following material.

- 1 The Air Navigation Order (SI 1989 No 2004)
- 2 CAP 393 Air Navigation : The Order and The Regulations
- 3 CAP 168 Licensing of Aerodromes
- 4 Airport Services Manual (ICAO) Part 1. Third Edition 1991 Rescue and Fire Fighting.
- 5 The Particular Aerodrome Licence in force at the time.

THE AIR NAVIGATION ORDER (ANO) 1989. ARTICLE 76

Under article 76 of the ANO certain movements of particular types of Aircraft are required to take place from Aerodromes that are either licensed under the ANO or are Government run Aerodromes, such as military establishments or which are run by The Civil Aviation Authority.

A Movement is either a Take Off or a Landing.

Aircraft having a maximum authorised weight exceeding 2730 kgs must use one of the above mentioned aerodromes if they are carrying out movements for the purposes of:

- (1) (i) The public transport of passengers.
- (ii) Flying instruction for the purposes of obtaining a pilot's licence or the inclusion of a particular aircraft rating or a night rating.
- (iii) The carrying out of a flying test in respect of the granting of a pilot's licence, a night rating or an aircraft rating.

Aircraft which do not exceed 2730 kgs maximum authorised weight must use one of the above mentioned aerodromes if they are carrying out movements for the purposes of:

- (2) (i) *SCHEDULED* journeys for the public transport of passengers.
- (ii) Flights for the public transport of passengers beginning and ending at the same aerodrome. (A typical example of this is pleasure flights at summer fetes etc.)

- (iii) Flying instruction for the purposes of obtaining a pilot's licence or the inclusion of a particular aircraft or a night rating.

OR

The carrying out of a flying test in respect of the granting of a pilot's licence, an aircraft rating or a night rating.

- (iv) Flights for the purposes of public transport of passengers at night.

NOTE: Helicopters require to use one of the above mentioned aerodromes only if they are carrying out movements specified in 2 (i) and 2(iii).

Summary:

The ANO therefore specifies the movements of particular aircraft that must take place from either a licensed aerodrome or one operated by the Government or CAA.

THE AERODROME LICENCE

Following an application and compliance with the requirements of CAP 168 an Aerodrome Licence may be issued by the Authority (CAA). Conditions imposed by the licence may vary between aerodromes but clause 2 of the Aerodrome Licence will state the requirements for provision of Rescue and Fire Fighting (RFF) Services.

A typical clause 2 statement will read:

No aircraft shall take-off or land at the aerodrome unless such fire-fighting and rescue services and such medical services and equipment as are required in respect of such an aircraft in the Authority's Publication CAP 168 (Licensing of Aerodromes) are provided there.

Such services and equipment shall at all times when the aerodrome is available for take-off or landing of aircraft be kept fit for *immediate turnout*.

Article 78 (5) of the ANO states that the holder of an Aerodrome Licence granted under this order shall not contravene or cause or permit to be contravened any condition of the Aerodrome Licence at any time in relation to aircraft engaged on flights that are required to take place from a licensed aerodrome.

Summary:

An offence under the ANO is therefore committed if the conditions of the licence are not met. Clause 2 requires RFF facilities to be provided in accordance with CAP 168 chapters 8 & 9.

CAP 168 CHAPTERS 8 & 9

These chapters should be read in full by the student. It is not intended or recommended that you attempt to memorise the tables listed in chapter 8 although it is important that you are familiar with the basic requirements. It will assist if you have these chapters available as you read through this note.

CHAPTER 8

Minimum Scale of Services to be Provided

The scale of RFF facilities is determined by *the overall length, maximum fuselage width and the frequency of operation of the largest aircraft using the aerodrome.*

When the number of movements of the largest aircraft totals *less than 700* in the busiest three months of the year the RFF protection provided may be that appropriate to the next lower category.

NOTE: A movement is either a take-off or a landing.

Unless the Authority has agreed in writing to alternative arrangements, where an aerodrome has taken advantage of the RFF category reduction under the less than 700 movements rule described in 3.1, for all other movements of aircraft received on an occasional basis, the RFF cover is to be provided to a minimum of the level appropriate for the specific aircraft as detailed in Table 8.1.

Table 8.1 lists the categories according to aircraft size. Table 8.2 details the *MINIMUM* amounts of extinguishing media required to be provided and carried on the appliances.

It is important to realise that the amounts of media required under the various tables is a *MINIMUM* quantity that has been calculated by various experimental means and it may not be sufficient to provide for a sustained attack at a major aircraft fire and in this respect your attention is drawn to Appendix 8D of chapter 8.

Table 8.2 has been calculated by reference to The Critical Area.

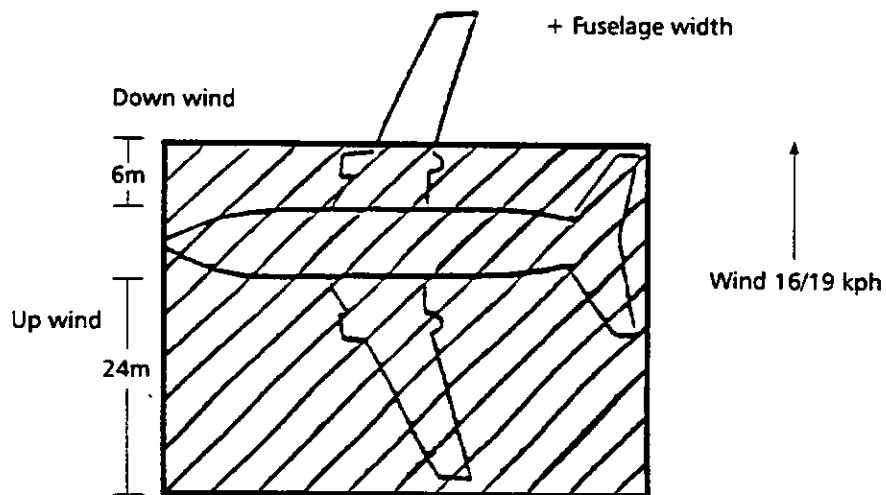
The Critical Area is a concept for rescue of the occupants of an aircraft. It differs from other fire fighting concepts in that, instead of attempting to control and extinguish the entire fire, it attempts only to control that area of the fire adjacent to the fuselage.

The objective is to safeguard the integrity of the fuselage and maintain tolerable conditions for its occupants. (From experience it is known that fire can penetrate to the interior of a fuselage within one minute under certain circumstances).

The size of the controlled area required to achieve this objective for a specific aircraft has been determined by experimental means.

Theoretical Critical Area

From experiments carried out it has been established that for an aircraft with a fuselage length equal to or greater than 20 metres, in wind conditions of 16/19 kph and at right angles to the fuselage, the Theoretical Critical Area extends from the fuselage to a distance of 24 metres upwind and 6 metres down wind.



Practical critical area = 0.66 of theoretical area

Diagram No. 1 Theoretical Critical Area

For smaller aircraft a distance of 6 metres on either side is considered adequate.

In order to provide a progressive increase in the Theoretical Critical Area a transition is used when the fuselage length is between 12 m and 18 m. (See ICAO Airport Services Manual Part 1 Rescue and Fire Fighting.)

In practice it is seldom that the entire Theoretical Critical Area is subject to fire and so a smaller area, for which it is proposed to provide fire fighting capacity, is referred to as the PRACTICAL CRITICAL AREA. This is calculated as 2/3rds ie .66 of the Theoretical Critical Area.

To calculate the amount of water required a simple calculation is necessary. Referring to Diagram No 1 of this note you will see that given the aircrafts overall length and maximum fuselage width the Theoretical Critical Area can be ascertained, to calculate the Practical Critical Area (PCA) multiply by .66.

Water required is therefore:

Practical Critical Area x Rate of Application x Time of Application

Rate of Application is 5.5 litres per minute per square metre.

Time of Application is calculated as 1 minute. **NOTE: For Control Only.**

Water Quantity is therefore PCA x 5.5 x 1

Following control, water is required for:

- a) Maintaining Control and/or
- b) Extinguishment of Remaining Fire.

This amount cannot be calculated exactly as it depends on a number of variables.

VARIABLES

1. **Gross Mass of Aircraft.** Both Concorde and a B747 because of their overall length come under Category 9. It could be expected that because of its sheer mass, water requirements to deal with a 747 well alight would be far greater than for Concorde. Construction methods and materials can also affect media requirements.
2. **Passenger Capacity of Aircraft.** The actual passenger capacity at the time of an incident will have a certain effect on the evacuation time. It could be expected that with a serious fire involving one side of a fully laden 747 that the evacuation time could approach, if not exceed 90 seconds. Escape routes would obviously need to be maintained throughout this period.
3. **Fuel Load of Aircraft.** Most aircraft involved in an accident during take off could be expected to be carrying more fuel than an inbound flight. If vast amounts of fuel are released from the tanks and become involved it follows that more media may be required for both control and extinguishment.
4. **Previous Experience.** The previous experience of any fire fighter is of paramount importance when attending an incident. This presents some difficulty to the Aerodrome Fire Services as Aviation Accidents involving fire are actually not commonplace occurrences. It is essential therefore that good practical training is ongoing for all RFF personnel and this must be primarily aimed at ensuring that media is not wasted and that an entry into the aircraft is made as soon as possible if lives are to be saved.

Apart from attending actual incidents there is no substitute for realistic, hot and difficult practical training exercises using realistic training aids.

To provide for additional water for the PCA an increase is *included* in the figures set out in table 8.2. The amount being enhanced by a percentage according to the category of the airport.

<i>Airport Category</i>	<i>Percentage Increase</i>
1	0
2	27
3	30
4	58
5	75
6	100
7	129
8	152
9	170

Temporary Depletion of RFFS Chapter 8 Section 4

It is essential that a degree of flexibility is available as far as time is concerned and 4.1 attempts to describe the maximum periods.

The important fact to note is that the temporary depletion facility is provided to cater for unexpected failures and depletions. It is not intended to be used to cover situations where shortfalls are known or planned in advance.

Significant changes to cover should be promulgated by a class 1 NOTAM and the CAA Fire Service Branch informed.

Availability of Extinguishing Media Section 5

Foam at aerodromes up to and including Category 3 must meet performance level 'B', at aerodromes Categories 4 to 9 the foam must meet performance level 'A' or 'B'. Performance level 'B' is strongly recommended.

Where Monnex dry powder is used a 50% reduction may also be applied.

Where powder is chosen as the complementary medium there must also be a quantity of CO₂ or BCF for use on aircraft engine fires. The actual amount will depend on the RFF category and should be determined by consultation with the Divisional Licensing Officer.

Where the main complementary medium is a dry powder there must also be a quantity of halocarbon (BCF 1211) or CO₂ with a suitable applicator for use on aircraft engine fires.

The appropriate minimum amounts of halon are:

RFF Categories Special to 4	=	9 kgs
RFF Categories 5 – 9	=	50 kgs

The appropriate minimum amounts of CO₂ are:

RFF Categories Special to 4	=	18 kgs
RFF Categories 5 – 9	=	100 kgs

Where the main complementary medium is Halon 1211 or CO₂ there must also be a quantity of dry powder to assist in dealing with a running fuel fire. Where this additional quantity of dry powder is provided in hand held (minimum capacity 9 kg) extinguishers it will not be necessary to comply with the discharge rates.

Appropriate minimum amounts of powder to be provided are:

RFF Categories Special to 4 = 9 kgs
RFF Categories 5 – 9 = 25 kgs.

At all aerodromes up to a maximum of 50% of the complementary media may be replaced by water for the production of a foam meeting performance level "B". For the purpose of substitution the following rates will apply:

1 kg Dry Chemical Powder or Halon= 1 litre water
2 kg Carbon Dioxide = 1 litre water

Response Time Section 6

Response time is defined as the time between the initial call to the rescue and fire fighting service and the time when the first responding vehicle(s) is (are) in position, and if required to, produce foam at a rate of at least 50% of the discharge rate specified in Table 8.2.

The operational objective of the RFFS should be to achieve response times of two minutes and not exceeding three minutes, to the end of each runway, as well as to any other part of the response area in optimum visibility and surface conditions.

The response area extends to the end of each runway and all other areas of the aerodrome where aircraft park or taxi immediately prior to, or following any flight which under the Air Navigation Order is required to use a licensed aerodrome.

Guidance on measures which help to achieve and maintain a satisfactory response capability are given in Appendix 8B.

To meet the operational objective as nearly as possible in less than optimum conditions of visibility it may be necessary to provide guidance for rescue and fire fighting vehicles. See Appendix 8B paragraph 1.1.7.

Appliances Section 7

It should be noted that performance criteria are set out in appendix 8A. This is a separate requirement to and is not connected with response times.

The aim is to effectively intervene as quickly as possible and it is therefore necessary to provide appliances that fully conform to the performance standards.

Foam tenders equipped with monitors should be able to produce foam whilst on the move at slow speeds (8–10 k/hr [3–5 mph]) and at aerodromes in Categories 5–7 there must be at least two foam producing appliances with aspirating monitors to facilitate an attack on a fire from more than one point or quarter. These monitors need an effective range at least equal to the length of the longest aircraft normally using the aerodrome and the capability to deliver foam in a dispersed pattern for blanketing purposes. At aerodromes in Categories 8–9 there must be at least three foam producing appliances which meet the above criteria.

Manning of Appliances Section 9

This section provides minimum manning requirements at aerodromes of category 1-3. It is virtually impossible to stipulate a blanket figure for aerodromes category 4-9 as a number of factors need to be taken into account.

These factors include:

- (a) Types and numbers of appliances provided.
- (b) Number of personnel required to operate appliances and equipment provided.
- (c) Any requirement to man additional appliances such as RIV, ambulance or other specialist rescue equipment eg Hovercraft.
- (d) Ability to meet response time. In event of problems meeting response times it may be necessary to provide additional Fire Station(s) with the resultant increase in manning.
- (e) On many stations additional duties are undertaken and on occasions these mean a requirement for an increase in minimum manning levels.

The Divisional Licensing Officer will consider these along with all other relevant factors when assessing manning requirements.

Selection of Personnel Section 10

In addition to the medical requirements outlined in this section Officers in charge should seriously consider the academic standards of all applicants. A satisfactory educational standard is essential if candidates are to be successful on external training courses.

CONCLUSION

Officers should fully familiarise themselves with the contents of CAP 168 chapters 8 & 9.

Any queries concerning an individual aerodrome should in the first instance be raised with the Divisional Licensing Officer.

All licensed aerodromes will be formally inspected at least once a year, this will include the RFFS. Officers in charge can assist greatly by ensuring that the requirements imposed under clause 2 of the Aerodrome Licence are available throughout promulgated hours and by ensuring that records are regularly maintained of tests, training and personnel and that these are always available for inspection by the Authority's Inspectors.

September 1991



ROPE RESCUE PROCEDURES AND EQUIPMENT
TECHNICAL BULLETIN 1/1990 (SECOND EDITION)

The Working Group on Rope Rescue Procedures and Equipment, which was established to review and revise Technical Bulletin 1/1990 has completed its work. A Second Edition of Technical Bulletin 1/1990 has been published.

2. A copy of the revised Technical Bulletin is attached for the information of Chief Fire Officers. Further copies can be purchased from HMSO, price £5.95 (ISBN 0 11 341077 8).

File reference : FEP/92 196/1500/4

Telephone contact number : 071 217 8746

COMPUTER MODELLING OF LARGE OIL TANK FIRES

1. In a study for the Home Office Fire and Research Development Group (FRDG) prepared by Ewbank Preece Ltd on firefighting foams, associated equipment and tactics, it was suggested that computer modelling of large oil tank fires should be considered, particularly since experience of such fires was lacking.
2. AEA Technology has carried out a feasibility study into the use of computer models in this area.
3. The report concluded that the models used would need to be demonstrated to be accurate by comparing their predictions with experimental data. However, the large dimensions of an oil tank fire would make validation of models against experiment extremely difficult and the results would need to be treated with caution.
4. In light of the report's conclusion, the high cost of progressing further work and the possibility that the results of further work would not produce any practical benefit for the fire service, the Home Office does not intend to proceed with AEA's proposals for further work.
5. FRDG have produced a summary of the report and a copy is attached. Further copies can be obtained from the Fire Experimental Unit Information Desk.

c/o Fire Service College
Moreton in Marsh
Gloucestershire
GL56 ORH
Telephone 0608 51470

File reference number: FEP/91 321/1500/3

**TECHNICAL BULLETIN 2/1993
INCIDENTS INVOLVING RADIOACTIVE MATERIALS**

Purpose

1. The attached technical bulletin on incidents involving radioactive materials is being issued as guidance to replace bulletin "The role of the Fire Service at incidents involving radioactivity", dated June 1984.

Background

2. Following representations by the two Central Fire Brigades Advisory Councils, the Home Secretary decided in January 1987 in consultation with the Secretary of State for Scotland to establish a joint working group to examine any firefighting implications for the British fire services arising from the accident at the Chernobyl nuclear power installation in April 1986.
3. The Joint Working Group, under the chairmanship of HM Chief Inspector of Fire Services, was given the following terms of reference:

"To consider the implications of the Chernobyl accident of April 1986 for the Fire Services of Great Britain; to review in the light thereof the adequacy of the current national guidance on the role of the Fire Services at incidents involving radioactivity; to recommend what further guidance, if any, is desirable; and to report to the Central and the Scottish Central Fire Brigades Advisory Councils by 31 October 1987".

The Working Group on Incidents Involving Radioactivity

4. The Joint Working Group on Chernobyl made twenty-five recommendations, one of which led to the formation of the Joint Committee on Fire Brigade Operations' Working Group on Incidents Involving Radioactivity. The Working Group was given the following terms of reference:

"To consider those recommendations identified in the Report of the Joint Working Group on Chernobyl as being appropriate for consideration by the Operations Committee and, in the light of the argumentation contained in the Report and consulting other Joint Committees and outside agencies as necessary, report to the Joint Committee on Fire Brigade Operations at the earliest opportunity".

The Revised Guidance

5. The Working Group's remit also included an invitation to

undertake the revision of the general guidance on the role of the fire service at incidents involving radioactivity, issued in 1984, on behalf of the Joint Committee on Fire Brigade Operations. The attached Technical Bulletin replaces the 1984 guidance which is cancelled.

6. The guidance contained in this Technical Bulletin is intended to ensure that fire brigade operations are carried out in compliance to statutory regulations and current practice. However, it must be recognised that radiological protection is subject to constant review and that this advice reflects current opinion. It is likely that reformulated guidance will need to be issued by the end of the decade and this has already been recognised by the Central Fire Brigades Advisory Councils.

General

7. Further guidance on personal dosimeters for fire service use will be issued shortly.
8. The information contained in this bulletin is for guidance to brigades. There are no direct financial or manpower implications.
9. Further copies of this technical bulletin can be obtained from HMSO for £13.95 each.

File Reference: FEP/92 23/71/2
Telephone enquiries: 071 217 8745

**FIRECODE - SUPPLEMENT ONE TO HEALTH TECHNICAL MEMORANDUM 81:
"FIRE PRECAUTIONS IN NEW HOSPITALS"**

NHS Estates (an Executive Agency of the Department of Health) has recently issued to health estate managers, as part of the FIRECODE series, Supplement 1 to Health Technical Memorandum (HTM) 81 - "Fire Precautions in New Hospitals". It is an interim publication and incorporates revisions required by the removal of Crown immunity and the Building Regulations 1991.

2. It is expected that a fully revised version of HTM 81 will be prepared for publication by 1995.

3. This Supplement has been prepared in consultation with the Department of the Environment, the Home Office, the NHS and the Chief and Assistant Chief Fire Officers' Association. It forms an essential part of Firecode with which the Secretary of State for Health requires NHS trusts and health authorities to comply.

4. A copy of the Supplement is enclosed for the information of Chief Fire Officers. The Home Office recommends that the document be used by fire prevention officers, in conjunction with HTM 81, when responding to requests for advice.

5. Additional copies of the Supplement may be purchased from HMSO, priced at £45 (forty-five pounds); (ISBN 0-11-321424-3).

6. There are no cost implications, apart from the the purchase of extra copies of the publication, and no additional manpower implications arising from the issue of this guidance to fire brigades.

Home Office contact: Mr A Jack 071 217 8741
File reference: FEP/87 47/94/2

ITEM 8
DCOL 7/1993

FORM FP1 "APPLICATION FOR A FIRE CERTIFICATE": TRANSFER OF STOCKS TO WOKING DEPOT AND UPDATING OF NOTES ON COMPLETING THE APPLICATION FORM

Following the move of the Prison Service to executive agency status on 1 April 1993, it has been necessary to transfer the stocks of form FP1 "Application for a Fire Certificate" from their Supply and Transport Branch depot at Branston to the Home Office stores depot at Woking. Supplies of the form should now be requested from:-

Home Office Stores
Unit 11
Goldsworth Park Trading Estate
Horsell
WOKING
Surrey
GU21 3BA

(Telephone: 0483 751388)

2. Paragraphs 6, 9 and 11 of the notes which accompany the form have been updated and a copy of the amended version, which will become available when existing stocks have been used, is enclosed for the information of Chief Fire Officers. Your attention is drawn in particular to the change of address in paragraph 6(b) which relates with immediate effect to the forwarding of completed application forms to the HM Fire Service Inspectorate's White Rose Court address in Woking if the premises concerned are situated in England or Wales and are owned or occupied by the Crown.

Home Office contact: Mr A Jack 071 217 8741

File reference: FEP/93 6/233/1