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General Introduction

1 ORIGIN

1.1 Since 1995 the UK Civil Aviation Authority (CAA), in co-operation with industry, has been reviewing the adequacy of the current mandatory training and certification requirements contained in Civil Aviation Publication (CAP) 168 – Licensing of Aerodromes. The review stemmed from a recognition in the UK, and Internationally, through the International Civil Aviation Organization (ICAO) Rescue and Firefighting Study Group, of the benefits of basing fire service training on competence. The Aerodrome Standards Department (ASD) has presented the issues to the Senior Airport Fire Officers Association (SAFOA) and the Airport Operators Association (AOA) Technical & General Aviation Committees. The vehicle for this work is a joint working group, the Training Standards Consultative Group (TSCG), which comprises representatives from the AOA, Serco International Fire Training Centre and The Fire Service College (as Aerodrome Fire Service training providers), the Ministry of Defence, BAA plc Fire Service, SAFOA and the CAA. In developing the standards the workload has been significant and a contractor has been used to produce the standards on behalf of the TSCG.

1.2 Prior to the formation of this group, consultation regarding fire service training standards was conducted through the International Fire Training Centre (IFTC)/ Airport Operators Association (AOA) Consultation Group.

The terms of reference of the Group are defined as:

(a) To review the adequacy of current mandatory training and certification requirements.

(b) To review regularly the adequacy of current rescue and fire fighting training in the light of new developments and recent experience.

(c) To make recommendations concerning rescue and firefighting training to SRG's Head of Aerodrome Standards Department.

(d) To disseminate information regarding rescue and firefighting training to Aerodromes and Training Providers as may be appropriate.

1.3 The TSCG has determined that a system more appropriate to the needs of the task is necessary, and has produced a set of standards for the competence of Rescue and Fire Fighting Service (RFFS) personnel, including a structured, effective, yet more flexible means of assessment. TSCG members fully discussed the cost implication of these standards, but collectively concluded that it was impractical to indicate initial and continuing implementation costs.

2 PURPOSE

2.1 Aerodrome management should have a written corporate policy, which acknowledges that training for competence is an integral part of its strategy. This policy should be compliant with the regulator's requirements. It should acknowledge that the key objective of training for competence is the development and use of training and assessment systems that contribute to the efficient delivery of services while eliminating or reducing risk to the organization, its staff and equipment, the community within the boundaries it serves and the environment.

2.2 Training for competence is not a replacement of current training practices. It is a method by which training is defined in terms of outcomes that can be delivered within a flexible but rigidly controlled quality assured environment.

2.3 The existing methods of training have to be agreed and certificated by the CAA, this will not change. Aerodrome licensees will still have to meet nationally agreed standards for training and CAP 699 offers greater flexibility in where it is delivered.

2.4 Training for competence is an essential part of the 'safe person concept' and when operated by licensees will enable all to demonstrate that they can consistently and competently perform their work. Training for competence provides a framework that offers:

(a) A systematic method of managing and organising the development, delivery and evaluation of all the training provided by the licensee.

(b) An objective assessment process that can be used to measure consistently the ***Acquisition*** of knowledge, skills, attitude and understanding achieved by individuals and teams.

(c) An objective assessment process that can be used to measure, consistently and continuously, the ***application*** of knowledge, skills, attitude and understanding by individuals and teams in the workplace.

2.5 Firefighting personnel require training if they are to operate in an effective manner. All personnel engaged in RFFS duties must receive initial and recurrent competence-based training in their role.

2.6 Supervisors employed on RFF duties at Lower Category Aerodromes (Special, 1 and 2) **shall** commence the initial acquisition of competence through a Structured Learning Programme (SLP) at an Approved Training Provider (ATP). A Certificate of Competence endorsed by the CAA will be issued by the ATP after satisfactory completion of the SLP. Certificates of Competence will be valid for four years after which Certificates of Competence will require to be revalidated in a manner acceptable to the CAA.

2.7 At Aerodromes of RFF Categories Special, 1 and 2 the Firefighter SLP may be delivered by either an officer employed at the Aerodrome who holds a current Lower Category Aerodrome Supervisor's Certificate, or by any other officer who holds a current CAA Certificate of Competence to at least Supervisor (Crew Commander) level. Certificates of Competence issued to personnel employed at Lower Category Aerodromes (Special, 1 and 2) following completion of CAA approved local training will be valid for a maximum duration of two years. These certificates are only valid for use at the aerodromes for which they have been issued.

2.8 All personnel employed on RFF duties at aerodromes of RFF Categories 3-9 **shall** commence the initial acquisition of competence through a Structured Learning Programme (SLP) at an Approved Training Provider (ATP). Certificates of Competence endorsed by the CAA will be issued by the ATP after satisfactory completion of an appropriate SLP. Certificates of Competence will be valid for four years after which Certificates of Competence will require to be revalidated in a manner acceptable to the CAA.

2.9 In addition to formal training delivered by an Approved Training Provider for the purposes of acquiring a Certificate of Competence it is essential that firefighters receive familiarisation training during interim periods and each licensee should appoint a competent person to establish and oversee the training programme. The programme should continuously demonstrate that all personnel possess and practise the necessary skills and knowledge to complete required tasks safely, expeditiously and effectively.

2.10 A licensee may decide that an initial fire-fighting programme could be delivered at an aerodrome. The licensee will have to seek approval from the CAA that the level of training and the levels of delivery, from suitably qualified personnel, meet the standard of competence required for that role. The licensee will also have to demonstrate that sufficient management systems are in place to support the programme and that necessary arrangements are in place to satisfy the hot fire training requirements of the course. All health and safety/hygiene arrangements should be similarly met.

A licensee's training policy can appear in many formats but in every case it should:

(a) Identify and define the licensee's strategic training and development needs.

(b) Set the licensee's strategic training aim, objectives and priorities.

(c) Establish the structure, management, resources and facilities for the training function.

(d) Identify assessment methodologies.

(e) Establish the process for auditing, evaluation and reviewing the training function.

(f) Detail the process for reviewing the training policy.

(g) Should ensure that the unit and elements related to the core tasks are practised or simulated as defined here in.

(h) Be published in or cross-referenced to the licensee's Aerodrome Manual.

2.11 For the achievement of competence the individual shall meet the job performance requirements defined for the role as explained in the Aerodrome Manual approved by the licensing authority.

2.12 The ongoing training and assessment process to provide continuous evidence of competence in role, may be achieved in one of two ways or a combination of both. It is essential that whichever process is employed, it is delivered in line with the licensee's original policy statement.

2.13 The licensee may wish to continue to employ the services of an approved training provider to assess competence in role and task of the RFFS personnel. This can be achieved by the individual attending a formal revalidation SLP which includes a combination of assessment(s). This programme will assess individuals against the core competencies required for his/her role and task. Following successful completion of the programme, a Certificate of Competence will be issued which is valid for four years.

2.14 If the training provider produces a modular training and assessment programme which assesses against the criteria in CAP 699 part 3, the licensee may choose to adopt this method. If this method is adopted, it should be managed to ensure that every unit in CAP 699 relevant to role and task is assessed within a four year period. This will then form part of a Certificate of Competence to be obtained.

2.15 The licensee may wish to design an ongoing training and assessment process that can be managed and delivered on aerodromes. This will be accepted as an alternative method of compliance. The process employed to deliver such a programme must comply fully with the appropriate methods of assessment and evidence requirements as detailed in CAP 699.

2.16 In order to introduce this programme for a licensee's own use, it is not required for the aerodrome licensee to be an approved training provider. However, the criteria stated below will apply and will need to be formally agreed with CAA SRG, prior to the programme being promulgated.

2.17 If this method is adopted, it should be managed to ensure that every unit in CAP 699 relevant to role and task is assessed within a four year period. This will form part of a Certificate of Competence to be obtained.

2.18 A task analysis enables the licensee to identify the tasks required to be carried out by each member of the RFFS in relation to the role they are expected to perform during response to an aircraft accident scenario.

2.19 A training needs analysis will identify both the underpinning knowledge & understanding (K&U) and the practical skills required to carry out the tasks required of RFFS personnel in relation to their role i.e. firefighter, supervisor, manager. This analysis will also include an evaluation process which measures the outcomes of the training provided by the licensees against published aims and objectives to ensure that these are being fulfilled.

2.20 The assessment process shall be operated in accordance with the acceptable means of compliance outlined in CAP 699. It shall include the assessment of K&U in addition to skills be they practical, manual, social, interpersonal or intellectual.

2.21 Assessors shall be qualified to, or working towards a nationally recognised suitable standard or equivalent.

2.22 The role of moderator will be performed by the CAA, Aerodrome Standards Department.

2.23 **Identified Training Needs**

2.23.1 The licensee's policy shall include a section to set out the process by which an individual may submit additional or alternative evidence of competence if, during an assessment, a training need is identified. This will also include the process for individuals to display competence if they are returning to duty following a prolonged period of absence. It will also be required to show how the training needs of any personnel transferring into the organisation will be assessed, to ensure competence in role and task of that individual.

2.23.2 The policy should set out the procedures to be followed in the event of a dispute regarding any individuals competence and/or assessment.

2.24 **Quality Assurance**

2.24.1 The assessment process must have robust and auditable quality assurance procedures. This shall include suitably qualified internal verifiers and a qualified independent person or organisation to externally verify the complete assessment process.

2.25 **Frequency Analysis**

2.25.1 The licensee shall carry out a frequency analysis to determine periodicity at which competence in each unit (and element) will be assessed.

2.25.2 The minimum will be that, for all RFFS personnel employed at aerodromes where the RFFS category is 3 to 10, they must be assessed in skills and knowledge for every unit and element to ensure competencies in role(s) and task(s) during a four yearly period.

2.25.3 For all RFFS personnel employed at lower category aerodromes (where the RFFS category is Special, 1 and 2), they must be assessed in skills and knowledge for every unit and element to ensure competencies in role(s) and task(s) during a two yearly period.

2.26 **Recording**

2.26.1 A robust and auditable recording system shall be established. It will validate for each entry who assessed and confirmed the candidates competence and should include the information set out in Appendix B of CAP 699 Part 2 (page 2/19).

3 COMPLIANCE WITH STATUTORY REQUIREMENTS

To ensure the requirements of the Air Navigation Order are met, the CAA's Safety Regulation Group, specifically its Aerodrome Standards department, requires the adoption and application of the appropriate parts of this CAP by Aerodrome licensees and potential licensees.

3.1 All rescue and fire fighting personnel shall be properly trained to perform their duties in an efficient manner and shall participate in live fire drills commensurate with the types of aircraft and type of rescue and fire fighting equipment in use at the aerodrome, including pressure-fed fuel fires.

Note 1: Guidance to assist the appropriate authority in providing proper training is given in Attachment A, Section 16 of Annex 14; Airport Services Manual, Part 1.

Note 2: Fires associated with fuel discharged under very high pressure from a ruptured fuel tank are known as 'pressure-fed fuel fires'.

3.2 The rescue and fire fighting personnel training programme shall include training in human performance, including team co-ordination.

Note: Guidance material to design training programmes on human performance and team co-ordination can be found in Circular 216 (Human Factors Digest No.1 – Fundamental Human Factors Concepts) and Circular 227 (Human Factors Digest No.3 – Training of Operational Personnel in Human Factors).

3.3 The training curriculum should include initial and recurrent instruction in at least the following areas:

(a) airport familiarisation;

(b) aircraft familiarisation;

(c) rescue and fire fighting personnel safety;

(d) emergency communication systems on the aerodrome, including aircraft fire related alarms;

(e) use of the firefighting and rescue equipment provided by the licensee in accordance with Condition 2 of an aerodrome licence;

(f) application of the types of extinguishing agents provided at a licensed aerodrome;

(g) emergency aircraft evacuation assistance;

(h) fire fighting operations;

(i) adaptation and use of structural rescue and fire fighting equipment for aircraft rescue and fire fighting;

(j) dangerous goods;

(k) familiarisation with firefighters' duties under the aerodrome emergency plan; and

(l) protective clothing and respiratory protection.

The personnel designated to operate the equipment should be adequately trained and drilled for rescue services in the appropriate environment.

3.4 **Operators of vehicles**

The authorities responsible for the operation of vehicles on the movement area should ensure that the operators are *properly qualified*. This may include, as appropriate to the driver's function, knowledge of:

(a) the topography of the aerodrome;

(b) aerodrome signs, markings and lights;

(c) radiotelephone operating procedures;

(d) terms and phrases used in aerodrome control including the ICAO spelling alphabet;

(e) rules of air traffic services as they relate to ground operations;

(f) aerodrome rules and procedures; and

(g) specialist functions as required, for example, in rescue and fire fighting.

The operator should be able to demonstrate competency, as appropriate, in:

(a) the operation or use of vehicle transmit/receive equipment;

(b) understanding and complying with air traffic control and local procedures;

(c) vehicle navigation on the aerodrome; and

(d) special skills required for the particular function.

3.4.1 In addition, as required for any specialist function, the operator should be the holder of a valid UK driver's licence, a valid radio operator's licence or other licences.

3.4.2 The above should be applied as is appropriate to the function to be performed by the operator and it is not necessary that all operators be trained to the same level, for example, some operators' functions may be restricted to the apron.

3.4.3 If special procedures apply for operations in low visibility conditions, it is desirable to verify an operator's knowledge of the procedures through periodic checks.

4 AMENDMENTS TO CAP 699

Suggestions for improvements to this document may be submitted in writing to the Training Standards Consultative Group (TSCG) via:

Head of Aerodrome Standards Department (HASD), Safety Regulation Group, Civil Aviation Authority, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR.

5 TERMINOLOGY

For ease of interpretation several key terms are used throughout this document and are defined as follows:

5.1 **Activity Title:** Each Unit is made up of a number of recognizable activities.

5.2 **Acquisition:** The stage at which an individual is undertaking a structured learning programme which is designed to develop the knowledge, skills, attitude and understanding identified for a particular role. Once individuals have demonstrated that they have acquired the knowledge and skills identified for their role, they are described as 'competent in acquisition'.

5.3 **Application:** The stage at which individuals, having demonstrated that they are competent in acquisition, are now able consistently to apply their knowledge, skills and understanding in the workplace to the standard described in their role-map. Individuals who can consistently maintain this standard are described as having demonstrated 'competence in application'.

5.4 **Assessment(s):** The process of making judgements about performance. The means by which evidence of performance is collected and compared with the requisite standard and a judgement about performance is made and recorded.

5.4.1 **Assessor:** A person approved by the Civil Aviation Authority to make judgements about performance against the requirements of a course/programme and the Standards. (Further guidance can be gained by referring to the National Training Organization for Employment Standards in Training and Development D32/33 Units)

5.5 **Attitude:** A term that has a specific meaning, which may be defined as: A state of mind which governs the manner of an individuals thoughts and actions.

5.6 **APL:** The Accreditation of Prior Learning is one source of evidence of current competence/achievement. (Institute of Personnel and Development Assessor Awards)

5.7 **Continuous Assessment:** Continuous assessment is defined as regularly engaging in processes that review the workplace performance of all aspects of a firefighter's work, measured against the standards applicable to that role.

5.8 **Competence:** 'The ability to apply knowledge, understanding and skills in performing to the standards required in employment. This includes problems and meeting changing demands'. (QCA/SQA)

5.8.1 **A Certificate of Competence** is the evidence that an individual has satisfied the standards in acquisition and application (see paragraph 2.6)

5.8.2 **Competent in acquisition:** The ability of individuals to demonstrate that they can apply the learning acquired in the workplace to the standards defined in the performance criteria for their role.

5.8.3 **Competence in application:** The ability of individuals to demonstrate consistently that the performance outcomes defined for their role can be achieved to the standard expected in the workplace.

5.9 **Continuous Development:** The individual's ability to work continuously in seeking to improve performance.

5.10 **Debrief:** A means of analysing an outcome of workplace activity. It confirms the success of the activity or identifies where modification of action or thought process

needs to take place. The debrief is applicable to most functions and roles and is key to assessing competence in application of skills underpinned by knowledge and understanding.

5.11 **Element:** A description of the main activities necessary for the completion of the function described in a unit of competence. They are the subdivisions into which the function can be broken down.

5.12 **Evidence:** Anything that is presented as proof of competence. It includes:

(a) Direct Evidence – produced as a result of direct observation by the Assessor, including Performance Evidence and Supplementary Evidence.

(b) Performance Evidence – generated from observation of personal work including simulation.

(c) Supplementary Evidence – the result of questioning to determine underpinning knowledge and understanding.

(d) Diverse Evidence – the combination of Direct and Indirect Evidence.

(e) Indirect Evidence – produced by other Assessors or qualified instructors to support Direct Evidence.

5.13 **Function:** A complete activity that may take into account a number of tasks.

5.13.1 **Functional Title:** The way that tasks are organized within a role, the context and contingencies of how they are performed in the way that the function seeks to establish.

5.13.2 **Functional Performance Outcomes:** This reflects a broader concept of competence than outcomes of task or process. For these reasons functional outcomes have greater relevance to the roles of individuals and the work that they do, providing a better guide to their training and development needs. The role-maps, contained in the competence framework, identify all the functions for a particular role and clearly show the relationship with workplace performance and training and development needs.

5.14 **Formative Exercise:** A teaching exercise resulting in a formative report, which will describe a trainee's progress mainly for the benefit of the trainee.

5.15 **Formative Assessment:** an informal assessment, which provides feedback to candidates, tutors and trainers and is not usually recorded for external purposes.

5.16 **Hazard:** Something with the potential to cause harm. This could be anything from a slippery domestic kitchen to a radiation leak from a nuclear reactor.

5.17 **Knowledge:** What the individual must know or understand in order to carry out a role to the standard required.

5.18 **Instructor/Training Provider:** A person/Aerodrome licensee or Training Establishment authorized by the Civil Aviation Authority to provide instruction leading to the grant of a CAA Certificate of Competence.

5.19 **Learning:** Structured training programmes, made up of modules, which have been designed to support the learning and development of individuals to enable them to achieve and maintain the performance standards identified for their role.

5.19.1 **Learning Outcomes:** Learning outcomes serve the same purpose as learning or terminal objectives. The most significant difference is that learning outcomes are always derived from the performance standards. They underpin the performance criteria to be demonstrated in the acquisition stage. The training that would provide the underpinning knowledge and skills needed to perform these activities will first of all have to address more fundamental issues. The trainer will have to develop outcomes that identify and describe the outcomes of task and process.

5.20 **Moderator:** The representative of the Civil Aviation Authority qualified to make and verify assessments. This person is responsible for ensuring the uniformity of assessments and that courses/programmes are run in conformity with the approval.

5.21 **Risk Assessment:** Risk assessment is a very important element in the planning and implementation process. There are three inter-related component parts:

5.21.1 *Strategic Management:* This demonstrates management's commitment to safety by setting the organization's health and safety policy, deciding priorities, providing resources, and promoting a positive health and safety culture.

5.21.2 *Systematic* processes for analysing and assessing the risks and providing information to enable the strategic decisions to be made. Risk assessors identify the 'hazards' likely to be encountered at the various types of operational incident and access the level of risk presented by these hazards. Management acts upon the results of the risk assessment and commissions departments to develop and implement additional control measures. This could include, for example, information, personal protective equipment, equipment, systems of work, instruction, training and safety supervision.

5.21.3 *Dynamic* assessment at the 'sharp end' which recognises the practical nature of the Aerodrome Fire Service work. All personnel at an operational incident carry out dynamic risk management. The main responsibility lies with the Incident Commander who must identify the hazards, assess the risks, then make professional judgements in order to use the available resources in such a way to achieve an acceptable level of safety during work activities. An important part of risk management at the level is the post-incident review. This allows relevant information to be recorded and fed back

into the Strategic decision making process via the Systematic level in order that safety standards can be constantly improved.

Dynamic Management of Risk At Operational Incidents (Home Office Fire Service Guide) and the 'A Competence for the United Kingdom Fire Service' report, Fire Service Circular 15/1997, Part Two, A Guide to the Management of Training for Competence. Guidance relating to the development of Safety Management Systems at aerodromes is provided by SRG in 'The Management of Safety', available from ASD.

5.22 **Performance Standards:** benchmarks or specifications of expected work performance.

5.22.1 **Performance Management:** a system that translates the goals of strategic management into individual performance. This enables the achievement of optimum results through effective organization of work by establishing a competence framework in which an individual's performance can be directed, monitored, motivated and improved.

5.22.2 **Performance Criteria:** a description of the performance standards necessary to demonstrate that individuals have acquired the knowledge, skills, attitude and understanding identified for their role. Performance criteria define the key outcomes underpinning the functional activities in acquisition.

5.22.3 **Performance Outcomes:** a definition of the key outcomes underpinning the standards in applications. They are used to confirm that the individual can consistently apply the knowledge, skills, attitude and understanding identified in their role-map.

5.23 **Role:** a group of functional activities.

5.23.1 **Role-Mapping:** The collection of performance outcomes grouped together into functions that define the activities relevant to a particular role.

5.24 **Risk:** A measure of the likelihood that the harm from a particular hazard will occur, taking into account the possible severity of the harm.

5.25 **Safe Person Concept***:* In normal safety management, the intent is to make the work place safe, because this safeguards everyone. However, an operational incident can be an inherently dangerous workplace and may be impossible to make safe. Aerodrome Rescue and Firefighting Services must, therefore, direct their efforts to making the firefighter safe. This approach is known as the Safe Person Concept.

5.26 **Skills:** behaviours or actions, which require practice in order to be performed satisfactorily. Skills may be manual, social, interpersonal or intellectual.

5.27 **Simulation:** Any structured assessment exercise involving the organization and achievement of a specific task, which seeks to reproduce a real life situation. Simulations are used where assessment is difficult to carry out (e.g. for safety reasons).

5.28 **Summative Exercise:** An exercise designed to test achievement resulting in a summative report, which will describe the trainee's achievement during a summative phase of training. This report is used to assess the standard of practical performance.

5.29 **Summative Assessment:** assessment, which measures the candidate's achievement for a particular outcome or unit.

5.30 **Training and Learning:** The ability of individuals to acquire the knowledge, skills, attitude and understanding required in performing the functions defined for their role.

5.31 **Task Analysis**: A task analysis enables the licensee to identify the tasks required to be carried out by each member of the RFFS in relation to the role they are expected to perform during response to an aircraft accident scenario.

5.32 **Task Skills:** The routine and largely technical components of a function.

5.33 **Task Management:** The skills to manage a group of tasks and prioritise them.

5.34 **Training Needs Analysis:** A training needs analysis will identify both the underpinning knowledge & understanding (K&U) and the practical skills required to carry out the tasks required of RFFS personnel in relation to their role i.e. firefighter, supervisor, manager. This analysis will also include an evaluation process which measures the outcomes of the training provided by the licensees against published aims and objectives to ensure that these are being fulfilled.

5.35 **Transferability of Knowledge and Skills:** The ability to transfer successfully learning from one situation to another is of key importance for individual development and organizational flexibility. Identifying the opportunities that allow the transfer of learning gained from one particular activity to be applied in another is an essential consideration in the design of training. In some cases the transfer and 'application' of knowledge and skills to non-learned activities are relatively straightforward, in others it may be necessary for some additional supportive learning.

5.36 **Unit of Competence:** A descriptor of a discrete function carried out by an individual within an occupational area.

5.36.1 **Unit:** The grouping of elements of competence within a standard. A unit is capable of being certified independently.

5.37 **Understanding:** The context and expression of knowledge, skills and attitude and how they are applied in the job environment.

5.38 **Underpinning Knowledge and Understanding:** The fundamental knowledge and understanding necessary to perform to the Standard and to transfer the skills from one situation to another.

5.39 **Verifier:** An assessor approved by the Civil Aviation Authority to ensure that assessment process is carried out according to the set procedures and to the specified requirements of the Standard. (For further guidance please see the national Training Organization for Employment Standards in Training and Development D 34 Unit)

5.40 **Verification:** The process of monitoring and quality assuring assessment, its systems and processes. It is the final check to confirm that the judgements and decisions of assessors are accurate and consistency of assessment is being applied throughout the organization. Verification should provide quality assurance of both the training and the performance system.

5.41 **Vocational Qualifications:** Certificates awarded to individuals whose performance has satisfied an assessment process that is recognized by **the Emergency Fire Services Standard Setting Body (EFSSSB)** and accredited by an awarding body acceptable to the CAA.

Note: The CAA is a founder member of the Emergency Fire Services Standard Setting Body (EFSSSB) and continues to represent the industry in its future development.

5.41.1 **QCA:** Qualifications Curriculum Authority.

5.41.2 **SQA:** Scottish Qualifications Authority.

Part 1 Introduction to the Standards for the Competence of RFFS Personnel

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FIGURES

1 INTRODUCTION TO PART 1 – COMPETENCE FRAMEWORK

1.1 Role-maps have been produced for the generic roles of Aerodrome Firefighter, Supervisor and Manager. Each role-map is a collection of the functions that have been identified as being common to that particular role. These functions have been titled as Units. The Units that make up the role maps are referred to collectively as the 'The Standards for the Competence of aerodrome RFFS Personnel'.

Role maps enable a clear understanding of the generic roles within the aerodrome RFFS operations. They provide a tool against which performance can be assessed and measured, in order to plan for the four stages of development namely:

(a) Training and learning;

(b) Achievement of competence;

(c) Maintenance of competence;

(d) Continuous Professional Development (CPD).

1.2 **The Role-map Format**

Below is a breakdown showing how the rolemaps are structured (Figure 1), together with an explanation of their component parts. Each rolemap contains a number of units (Part 3), presented as follows:

1.2.1 A cover page shows the number and title of each unit. Each unit has a discrete number. The title page also gives a Unit Overview that explains the content and purpose of the unit. It also includes key aspects of the function performed and related performance criteria.

1.2.2 Areas of work and working environments are identified to show where the main sources of evidence are likely to be produced. Examples of the types of evidence that should be used when assessing performance are also included.

1.2.3 The next pages contain the Elements (standards in acquisition) that make up the unit. Elements are used to measure the achievement of competence in the role and they describe the activities necessary for the completion of that unit. For ease of reference, elements have been numbered consecutively e.g. 1.1, 1.2. Etc.

Each element contains the Knowledge and Understanding (K&U) and the Performance Criteria (PC) required for the successful performance of the Element. PCs are detailed outcomes that provide the criteria to assess and measure whether an individual has met the required standard of performance, or in other words is 'competent'. To be described as competent requires more than just the evidence of performance. The knowledge and understanding that underpin and support

performance also requires confirmation, particularly when assessing complex or unusual situations. (Generic lists incorporating knowledge and understanding are located in Part 3 of this document).

Figure 1 Unit and Role Map Structure

Firefighter, Supervisor, Manager

Unit Number	Unit Title	Firefighter	Supervisor	Manager
1	Save life at aircraft accidents and incidents	•	**RR**	**RR**
2	Extinguish Fire	•	**RR**	**RR**
3	Maintain operational readiness of resources	•	**RR**	**RR**
4	Prevent occurrence of emergencies through management of Aerodrome hazards and risks	•	**RR**	**RR**
5	Mobilise resources to respond to emergency	•	**RR**	**RR**
6	Site and position firefighting vehicles at accident/incident site	•	**RR**	**RR**
7	Command and control resolution of incident	**Dev**	•	•
8	Contain and control spillage or leak of hazardous substances	•	**RR**	**RR**
9	Develop self and others to improve performance	•	**RR**	**RR**
10	Plan and allocate resources to anticipate and respond to operational needs	**Dev**	•	•
11	Take responsibility for effective personal performance	•	**RR**	**RR**
12	Inform and educate the community to improve awareness of safety matters	**O**	**O**	**O**

Key

•	A unit mapped to this generic role. When this unit appears in a role map, competence in this function must be acquired and maintained thereafter. This is considered a core activity.
RR	**Role Related** A unit that has already been mapped to a subordinate role and in which competence should have been achieved. Competence in the unit is now mapped and should be maintained in relation to the role
Dev	**Developmental** A unit with a value as a developmental activity in this role
O	**Option** This is an optional unit that can apply to any role

1.3 Using the Standards in the Workplace

It is important to understand that completion of a training module does not in isolation determine that someone is competent. Competence can only be achieved and confirmed when there is sufficient and satisfactory evidence of consistent workplace performance.

The following examples explain the use of these standards and how the components of a unit are related:

One of the functions of a Supervisor's role is Command & Control Resolution of Incident (Unit 7). This unit contains two elements, one of which is Monitor progress of achievement of objectives (Element 7.2).

In order to perform this competently, one of the criteria to be met is that:

The accident/incident is resolved with minimum risk or injury. Performance Criterion (PC) 7.2.6

In meeting this criterion a person must satisfy the knowledge and understanding specifications relevant to each of the PCs within the element. Using the performance criteria referred to above it is necessary to know and understand: How to make and apply decisions based on dynamic risk assessment Unit 3, Knowledge & Understanding – Health and Safety.

To meet the performance criteria it is necessary first to complete a training and development programme and under close supervision, work towards competence, as measured by the Standards in Acquisition. Once competence in acquisition has been achieved, performance will be continuously and pro-actively measured and assessed against the Standards in Application.

The importance of having evidence gained from workplace experience is critical. Irrespective of the degree of realism that the training environment or a simulated scenario may offer there will always be certain aspects of performance that cannot be evidenced. Simulation cannot fully replicate a sufficiently dynamic environment that will enable the person to respond to high stress and risk situations that include time pressures and the tensions of communicating and working with people.

Wherever possible, performance evidence should be collected from real workplace activities supported by other relevant forms of evidence. However, given the nature of the Aerodrome RFFS activities, realistic simulation is acceptable to permit the performance evidence to be demonstrated.

Consistent performance evidence obtained from workplace experiences is essential in confirming competence in every function of an individual role.

The licensee's policy shall reference to a process by which any individual may submit alternative or diverse evidence of competence if, during an assessment, a training need is identified. This policy shall include the process for individuals to display competence if they are returning to duty following a prolonged period of absence.

It will also be required to show how the training needs of any personnel transferring into the organisation will be assessed, to ensure competence in the role and task(s) intended for that individual.

The policy shall set out the procedures to be followed in the event of a dispute regarding any individuals competence and/or assessment.

2 THE STATION BASED ROLES

2.1 The primary generic roles attributable to personnel engaged in the aerodrome RFFS may be grouped under the headings of Firefighter, Supervisor and Manager. The additional terms Crew Commander, Watch Commander and Station Commander have been used to assist licensees in understanding nationally agreed definitions; this terminology is a guide and licensees should determine sufficient levels of supervision in accordance with the requirements published in CAP 168, Chapter 8. The licensee may choose to adopt their own specific terms within the generic terminology of Supervisor and Manager.

2.2 The Firefighter Role

The Firefighter role map contains 9 functions that are common to the generic role of 'Airport Firefighter'. There are common features in all the main roles and in the fire service there is a general acceptance and understanding of what station-based roles involve. However, there is no such thing as a 'typical' Firefighter as all roles at Aerodromes can vary due to a number of factors such as risk, resource availability, organizational structure, etc. For this reason, the role of a Firefighter may be different from one Aerodrome to another. Even within Aerodromes, Firefighters on the same watch may have different role maps. For example, 'driving and siting emergency vehicles at operational incidents (Unit 6)' falls within the role of Firefighter, but not all Firefighters perform this function. It follows, that only those Firefighters who drive to incidents would have this function mapped to their roles and be expected to achieve and maintain competence in it.

2.3 The Supervisory (Crew Commander and Watch Commander) Role

Note: The role of supervisor differs considerably from Aerodrome to Aerodrome therefore for the purposes of this document it is intended to sub divide this function into two levels, Crew Commander and Watch Commander.

Investigation into the critical differences between the supervisory roles has confirmed that the major developmental aspects occur at Crew Commander level. The main distinction in the progression of competence therefore occurs between Firefighter and

Crew Commander. The distinction between Crew Commander and Watch Commander relates to the differences in responsibility and accountability.

2.4 The Managerial (Station Commander) Role

Progression will involve making the transition from Watch Commander to Station Commander introducing a higher management role. This significant change emphasises the difference between a role involving direct supervision of the watch, to one of co-ordinating and managing the overall activities and performance of the RFFS. However, many of the core skills which have been developed in previous roles are still appropriate. It is the range and context of a role within these functions that will change. For example, a Supervisor has responsibility for assessing all of the people on a watch as individuals and as a team. The manager will assess the overall performance of watch officers in achieving objectives.

2.5 Role Related Units and Underpinning Functions

Figure 1 (page 1/3) illustrates how the units are used to support development and progression through the three roles of Firefighter, Supervisor and Manager.

A total of 12 units have been developed for the Firefighter, Supervisor (Crew Commander, Watch Commander) and Manager (Station Commander) roles and they have been mapped to provide the core functions for each (Part 1, Figure 1).

Competence in the core units of any role must be achieved before progression to the next role. Where a unit is relevant to a subsequent role, but not core, the individual will have to maintain competence in a context that specifically relates to that role.

For example, the role of Firefighter and the competence required in many of the core firefighting functions underpins competence in all operational roles. The four units, 1,2,3 & 8, are firefighting functions that take place at operational incidents:

(a) 1. Save Life at Aircraft Accidents and Incidents

(b) 2. Extinguish Fire

(c) 3. Maintain Operational readiness of Resources

(d) 8. Contain and control spillage or leak of hazardous substance

These units also support the role of the Supervisor in two ways:

The Supervisor will, as a Firefighter, have achieved competence in these four units. However, there may be occasions when the Supervisor will perform the Firefighter role as a team member. When working in this way, the functions are described as ‘role related’. It will therefore be necessary for the Supervisor to maintain competence in these four units, as they clearly relate to this role. This role may involve local

arrangements for supervision and could be deemed as an individual supervising a crew.

When acting as a team leader the Supervisor will no longer perform the function of a Firefighter, but will instead*: 'Command and Control Resolution of Incident'* (Unit 7). However, these same units, 1,2,3 & 8, will now support or underpin the performance of the Supervisor in the leadership role (Unit 7). Consequently, it is the knowledge specification of these four units that must be maintained to support the competence of the Supervisor when performing this function.

Using the diagram in appendix A (page 2/15), it can be seen that a number of units are used to underpin performance in other roles. Progression through each role depends on maintaining competence in the role-related functions. It therefore follows that a Supervisor who has maintained the knowledge and understanding of the underpinning functions (Units 1 2 3 & 8, can only meet the function *'Command and Control Resolution of Incident'* (Unit 7).

From this example, it is clear that competence in the role related units of a previous role must still be maintained. It is also important to appreciate that units remain exactly the same in content and structure across all related roles. The command functions in both the Crew Commander and Watch Commander roles contain the same performance standards and there is no difference in the standard of outcome that must be achieved. What is different is the range. The range is used to describe such things as:

(a) Greater diversity of risk

(b) Additional human and physical resources

(c) Involvement with other agencies

(d) Increased responsibility and accountability

(e) Greater delegation of leadership

This enables the same unit to be used in the assessment of Supervisors (Crew Commander and Watch Commander), while providing a measure that can be used to assess performance as it relates to each distinct role. The range will also provide an indication of the training need an individual may have when progressing from the Crew Commander to Watch Commander role (Supervisor).

The standards of competence have been written to accommodate developments and changes in systems of work, procedures or equipment, etc. Using outcomes to specify the performance standard allows for such changes without affecting the quality of evidence gained from the assessment process.

3 SUMMARY

3.1 In summary, it is now obvious that the outcome of what is to be achieved for the purpose of 'Command and Control Resolution of Incident' (Unit 7) is the same even though:

(a) The means of achievement differs (the system of work);

(b) The methods of use of equipment and technology differs (workplace practices);

(c) The context of work differs (at the station, during an incident, after an incident, in daylight and in darkness);

(d) The level of role is different (Crew Commander or Watch Commander).

With the aid of the structure shown in Part 1, Figure 1, it is now possible to use the units from these generic role maps to meet the specific needs of the Aerodrome, its teams and individuals.

Part 2 Procedures for the Approval of Aerodromes and Training Providers carrying out training for which Certificates of Competence are required for personnel engaged on Rescue and Firefighting duties at United Kingdom Licensed Aerodromes

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1 INTRODUCTION

1.1 The purpose of this section is to provide advice and guidance that will enable Aerodrome Licensees to meet the standards set by the Civil Aviation Authority, (the CAA), in accordance with its aerodrome licensing requirements, for the competence of Rescue and Firefighting personnel forming part of the agreed minimum staffing level at United Kingdom licensed aerodromes.

1.2 These standards accord with those set out by the International Civil Aviation Organization (ICAO) in its Standards and Recommended Practices, which have been adopted by the United Kingdom. This document has been developed in conjunction with the Training Standards Consultative Group taking note of the United Kingdom Home Office Fire Service role maps.

1.3 The Aerodrome Standards Department (ASD) of the Authority's Safety Regulation Group (SRG) is the department responsible for the initial setting and on-going monitoring of these standards.

1.4 The following paragraphs set out the procedures and requirements for the approval of Aerodromes and Training Providers wishing to undertake the training of personnel engaged in Rescue and Firefighting duties at United Kingdom licensed Aerodromes. This training will lead to the award of a Certificate of Competence following successful completion of courses/programmes specified in paragraph 9 of Part 2 of this document.

1.5 Within the context of this document a Training Provider is considered to be any establishment staffed and equipped to carry out any form of mandatory training required by the Authority for Aerodrome Rescue and Firefighting Service personnel.

Note: It is felt that having made this definition clear the term' Training Provider' may be used from here on to describe an Aerodrome's own facilities for delivering training and/or facilities provided elsewhere.

2 ADMINISTRATION OF THE APPROVALS AND APPEALS PROCEDURES

2.1 A Training Provider seeking the Authority's approval should apply in the first instance (in writing) to the Aerodrome Standards Department (ASD) of the Authority's Safety Regulation Group. The application should be accompanied by a full description of facilities provided for the theoretical and practical conduct of the training proposed, together with copies of the programmes syllabi, testing, examination and assessment arrangements etc.

The Authority's approval process will normally consist of three distinct phases:

(a) An informal discussion stage at which the Authority's overall requirements will be explained and questions answered.

(b) A paper assessment stage in which programme content, details of personnel, course structure etc, will be reviewed.

(c) A practical assessment stage in which the physical and practical facilities will be formally inspected and lectures sampled.

2.2 On completion of the three phases, the Training Provider will be considered for recognition and approval on the basis of the information provided and obtained. ASD will formally confirm (in writing) acceptance of a Training Provider to conduct mandatory training. On-going approval will be subject to regular inspections under arrangements administered by ASD. If the Authority becomes aware that the required standards are no longer being met, it will give formal written notice to that effect. If, in the opinion of the Authority and after due written notice, the standards continue to be below those required, the recognition and approval may be revoked, suspended or varied.

2.3 The programmes content must meet the Authority's requirements and shall not be altered or amended without the prior written agreement of ASD. The Authority reserves the right to review the syllabus content and practical training requirements from time to time; adequate notice of required changes will be given in writing.

3 APPEALS

3.1 Any person who believes a Training Provider, during or at the end of a course or programme, has disadvantaged him or her by the conduct of an assessment shall have a right of appeal.

3.2 Every Training Provider shall therefore establish and publish an internal appeal procedure.

3.3 **Guidance**

Every person should be informed of the appeal procedure and of his or her right to appeal against the conduct of an assessment.

4 MANAGEMENT STRUCTURE

4.1 The management structure should ensure adequate supervision of all grades of staff involved in programme delivery by persons having appropriate experience and the necessary competence to maintain high, professional standards.

4.2 Full details of the management structure, indicating individual responsibilities, details of qualification, experience etc, are required with the initial application.

5 STAFF LEVELS

5.1 Sufficient and adequate numbers of suitably qualified teaching and technical support staff must be available to carry out the approved training. Particular emphasis will be placed on staff/student ratios, the previous aviation-related firefighting experience of the teaching staff and the level of teaching experience of those persons carrying out the training.

The guidance listed below will be of assistance to those seeking approved status.

5.2 Training Supervisor

A Training Supervisor shall be nominated to ensure that the overall standards of the training provider and its training meet the criteria laid down in this document and other associated documents.

Training programmes subject to this document are those designed to meet the requirements of the CAA's Aerodrome licensing requirements as set out in its document CAP 168, Chapter 8. These, in turn, are designed to comply with the contents of the International Civil Aviation Organization's (ICAO) Document Annex 14 to the Convention on International Civil Aviation, Volume One, Aerodrome Design and Operations, Third Edition (July 1999) and Document 9137–AN/898 Airport Services Manual Part 1, Rescue and Fire Fighting.

The training supervisor will be accountable for the technical content of all training programmes, lesson packages, student notes and other relevant material. The Training Provider will need to show how the programme content and material is to be kept current and up-to-date.

Training Providers should maintain an awareness of relevant present and proposed future legal and statutory requirements within the Aviation industry, which are relevant to the training.

5.3 Instructors

All instructors engaged in training must be competent and suitability qualified for the work that they undertake. Agreement of the nominated instructional staff will form part of the approval process. The Authority must agree any proposed changes in staff complement. Course Instructors will need to hold an appropriate training qualification and be in possession of a Certificate of Competence equal to or greater than the level of students under instruction. (Please see for further guidance 'Assessing NVQs/SVQs', March 1998, The National Training Organization for Employment Standards for Training & Development and, Part 3 – CAP 699.)

5.4 Support Staff

Sufficient numbers of support staff will be required in order that both practical and theoretical training can be carried out at a suitable pace, the aim being to ensure that students receive continuous instruction without the need for protracted breaks caused by exercises being set up, equipment serviced, etc.

6 ADMINISTRATION

6.1 A suitable means shall be provided in order to maintain:

(a) A personal record containing information relating to each student, including details of medical fitness and previous qualifications/competences.

(b) A record of assessments, both practical and theoretical, carried out on all training.

Note: Documents and records required by the Air Navigation Order may be kept in any suitable format. The Authority's Inspectors are authorised to inspect and copy this information on request. Student records should be retained for a minimum period of five years after the expiry of the previous certificate. Employees' records must be retained for the whole period of employment. In the event of an employee leaving the RFFS his or her records should be retained for a minimum period of 5 years. An example of information that should be included is contained in appendix B (page 2/19).

6.2 The Certificate of Competence, dated and validated for the periods specified in CAP 168, Chapter 8 will be issued and a copy retained by the recognised Training Provider following satisfactory completion of written, oral and continuous assessment, appropriate to the relevant programme. The Certificate of Competence should clearly indicate the differences between competencies in acquisition and application.

Samples of the proposed procedures for the conduct of written, oral and continuous assessment practices, together with the arrangements for marking, will need to accompany the application for approved status.

A summary of any test results for each candidate having attended the Training Providers course/programme should be retained for a minimum period of 5 years.

6.3 Only Certificates of Competence issued by approved Training Providers are valid on licensed Aerodromes within the United Kingdom.

6.4 Equal Opportunities Policy

All Training Providers should ensure that they have a policy that allows candidates to receive equal consideration, opportunity and access to training, development and assessment.

6.5 In the application of the policy, it is essential that training staff guard against discrimination on the basis of possible pre-assumptions that individuals because of their sex, race, characteristics or the subject of their circumstances make them less suitable a student for the training which they are undertaking.

6.6 All training staff must be made aware of this policy and its requirements. Guidance and instruction must be given to ensure that discriminatory attitude or practices are avoided in dealing with students.

6.7 **Access to assessment**

The Training Providers access and fair assessment policy must be understood and complied with by all candidates and the Training Provider's staff. No candidate shall receive unfair treatment on the grounds of sex, race, colour, nationality, ethnic origin, age, disability or special assessment requirements.

Note: In developing a policy, Training Providers should take note of the Disability Discrimination Act (1995).

6.8 **Monitoring**

Training Providers should monitor:

(a) Their own Equal Opportunities (EO) policy and procedures.

(b) Their own policy and procedures with regard to access and to fair assessment.

(c) The achievement of candidates in relation to Equal Opportunities considerations.

(d) The implementation plans for EO and fair assessment.

(e) The monitoring and review of EO and access to fair assessment.

6.9 **Medical Standards**

Students attending approved courses/programmes must have achieved the minimum medical standards described in CAP 168, Chapter 8.

7 FACILITIES

7.1 Training Providers must demonstrate that they are capable of carrying out the requisite level of both theoretical and practical training as well as satisfying the Authority that they have sufficient resources to enable them to fulfil these criteria.

Details of facilities to be used for both theoretical and practical training must be submitted in support of the initial application.

Note: Training Providers proposing to offer aviation RFFS training need to be conscious of the potentially negative environmental impact of such activities. They will need to provide evidence that their proposals are acceptable and compatible with local environmental requirements. (e.g. Environment Agency).

7.2 Whilst not a pre-requisite for approval, it is likely that in some cases residential facilities may be desirable. Where such facilities are provided, details of the level of service to be provided should accompany the initial application. Where residential facilities are not provided, the Authority must be assured that whatever arrangements are in place are adequate to ensure that training is conducted to an adequate pre-planned programme without excessive interruption.

8 HEALTH & SAFETY

A risk assessment should be conducted for any firefighting and/or rescue operation and any associated training. A competent person must conduct the risk assessment. Health and safety risks arising from training and operations shall be assessed and addressed by the employer, in accordance with local, national and statutory regulations. Risk assessment will enable the RFFS provider to judge whether the training contemplated reflects the operational need and is the safest way to deliver the identified training objectives, or whether other, equally effective alternative training methods can be used or devised.

9 STRUCTURED LEARNING PROGRAMMES

9.1 The purpose of approved Structured Learning Programmes (SLPs) is to enable Aerodrome Licensees to meet the Authority's requirements for the acquisition and demonstration of the levels of competence defined by the role maps.

9.2 Certificates of Competence may only be issued after competence has been demonstrated in acquisition and in application relevant to the roles of:

(a) Firefighter (Low Category Aerodrome)

(b) Supervisor (Low Category Aerodrome – RFF Category 2)

(c) Firefighter

(d) Supervisor (Crew Commander, Watch Commander)

(e) Manager (Operational/Non-operational Station Commander)

The CAA would normally expect all recognised Training Providers to have the capability and capacity to provide an agreed range of Structured Learning Programmes. A schedule of SLPs shall be included with the initial application. Individual programmes meeting the requirements of the CAA may also be considered.

Note: No SLPs promulgated by the Training Provider will qualify for endorsement with the CAA's logo unless authorised by ASD in writing.

9.3 **Programme Content**

Training Providers will need to present, for the CAA's approval, a syllabus for each SLP. Any material or significant changes to the approved syllabi shall be subject to prior written approval by the CAA.

10 POLICY ON PREREQUISITES FOR ATTENDANCE ON A STRUCTURED LEARNING PROGRAMME

The Training Provider shall ensure that they have a robust policy on entry criteria for ensuring that applicants are considered and offered the most appropriate course commensurate with their skills, experience and prior learning (APL).

10.1 From time to time personnel may wish to undertake SLPs according to the needs of Continuing Professional Development. Unless the requisite entry standards are met, Certificates of Competence issued after assessment following attendance on the training programme(s), shall only be endorsed 'Competent in Acquisition'.

All students on SLPs must meet the minimum entry standards, described below:-

10.2 Personnel nominated for **any** programme shall meet the medical criteria (6.9) and should have satisfied their employer that they are capable of absorbing the technical and practical aspects of the programme.

11 FIREFIGHTER (LOW CATEGORY AERODROME) – INITIAL

11.1 The programme may be offered to any persons meeting the requirements of paragraph 10.2.

11.2 **Supervisor (Low Category Aerodromes – RFF Category 2) – Initial**

The programme may be offered to any persons having:

(a) a current Certificate of Competence as a Firefighter (Low Category Aerodrome), or one which has expired within the preceding six months, or

(b) a current Record of Competence equivalent to that of a Local Fire Authority role mapped Firefighter.

(c) the equivalent Ministry of Defence (MOD) standard to that of the role of Firefighter

(d) National Vocational Qualification Level 2 Firefighter, Level 3 Operations or its equivalent

11.3 **Firefighter – Initial**

The programme may be offered to any persons having:

(a) a current Certificate of Competence as a Firefighter or Supervisor (Low Category Aerodrome), or one which has expired within the preceding six months, or

(b) a current Certificate of Competence as an Airport Firefighter, or

(c) a current Record of Competence equivalent to that of a Local Fire Authority role mapped Firefighter.

(d) the equivalent MOD standard to that of the role of Firefighter

(e) a National Vocational Qualification Level 2 Firefighter, Level 3 Operations or its equivalent.

Personnel must demonstrate competence in all core competencies to qualify for the issue of a Certificate of Competence.

11.3.1 **Firefighter – Recurrent**

The programme may be offered to any persons having:

(a) a current Certificate of Competence as an aerodrome Firefighter, or one which has expired within the proceeding six months.

Personnel must demonstrate competence in all core units to qualify for revalidation of a Certificate of Competence.

11.4 **Supervisor/Manager – Initial**

Supervisor (Watch Commander/Crew Commander) – This role will vary considerably between the various RFF Categories. The licensee should consider the pre-requisite entry standards for attending programmes aligned to this level of training needs. On successful completion of the course/programme the Certificate of Competence will enable the individual to operate as the Officer-in-Charge of the RFFS at an RFF

Category 3 aerodrome, or as a Supervisor (Watch Commander) at RFF Category 4 or 5 aerodomes.

The programme(s) may be offered to any persons having:

(a) a current Certificate of Competence in an appropriate subordinate role or one which has expired within the preceding six months, and

(b) A minimum of two years' operational experience in an appropriate subordinate role.

It is unlikely that an individual having spent less than six months in a subordinate role is capable of aspiring to participate in a Structured Learning Programme with the intention of acquiring the competences necessary to assume a role of supervisor/manager. However, an assessment of the potential of the individual appropriate Accredited Prior Learning is necessary to prove acceptability onto any proposed progressive SLP.

Personnel must demonstrate competence in all core units to quality for the issue of a Certificate of Competence.

11.4.1 **Supervisor (Crew Commander) – Initial**

Personnel nominated shall be in possession of a current Certificate of Competence in the role of Firefighter and have at least two years' operational experience.

11.4.2 **Supervisor (Watch Commander) – Initial**

Personnel nominated shall be in possession of a current Certificate of Competence in the role of Supervisor (Crew Commander) and have at least two years' operational experience.

11.5 **Supervisor/Manager – Recurrent**

The programme(s) may be offered to any persons having

(a) A current Certificate of Competence as a Supervisor (Crew Commander or Watch Commander), as appropriate or one which has expired within the preceding six months, or

(b) A current Certificate of Competence as a Manager (Station Commander) or one which has expired within the preceding six months.

11.6 **Manager (Station Commander) – Initial**

This course is restricted to Personnel having overall charge of RFFS facilities at Aerodromes meeting Rescue and Firefighting Categories 5 to 10, or their designated deputies.

Personnel nominated shall be in possession of either a current Certificate of Competence in the role of Supervisor (Watch Commander) or one which has expired in the preceding six months and have at least five years' operational experience as a Supervisor.

11.7 The competence required by a 'non-operational' Manager depends on the role expected of this post-holder at any particular Aerodrome. As such, it is incorrect to specify a programme for this post. Each Aerodrome should determine, in its policy and procedures, which competences are required and the extent to which these will be provided and assessed.

11.8 The CAA would normally expect all recognised Training Providers to have the capability and capacity to provide an agreed range of training. A schedule of training shall be included with the initial application. However individual programmes in accordance with the above may be considered.

11.9 Prior to the issue of an approval to carrying mandatory training, applicants will be required to state, in writing, that they have noted those requirements set out in this document which require prior agreement from the Authority before they may be changed and further, that any approval granted will be automatically invalidated should such changes be made without the Authority's prior written approval.

11.10 Further information can be obtained from: -

Civil Aviation Authority
Safety Regulation Group
Aerodrome Standards Department
Aviation House
Gatwick Airport South
West Sussex RH6 0YR

Telephone: 01293 567171
Facsimile: 01293 573971
www.caa.co.uk

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(24) ICAO Doc. 9137 – AN/898 Airport Services Manual. Part 1, Rescue & Firefighting (3rd Edition, 1990, and amendments), Chapter 8

(25) CAP 576 Model Emergency Orders

(26) CAP 700 Operational Safety Competences

(27) CAA Paper 98006 Use of Virtual Reality Simulation Techniques for Training Airport Officers

(28) CAP 699 Standards for Competence In Rescue and Fire Fighting Services at UK Licensed Aerodromes. (Part 3)

(29) Home Office Fire Service Circular 5/1996 Principles of Operational Training

(30) Dear Chief Officers Letter 11/1999 Practical Training for Compartment Fires

(31) Home Office (Fire & Emergency Planning Department) Fire Service Training Manual

(32) Home Office Technical Bulletin 01/1997, Breathing Apparatus, Command and Control Procedures, The Stationery Office, ISBN 0 11 341162 6

(33) Home Office Fire Service Manuals, Volume 1 and Volume 2, The Stationery Office, various

(34) HSG (65) Successful Health & Safety Management

APPENDIX A

Example Training Scenario

Aircraft Incident

Aircraft Engine Fire

Outline (Range covered)

1 An Aircraft develops an engine fire en-route to the holding area prior to take off at the Aerodrome. The Aircraft is in the process of evacuation.

Associated Hazards

Incident Involving Aircraft

Hazards Running Aircraft Engines (Pressurised fuel leaks), Aircraft structural collapse, Release of carbon fibres & other hazardous materials, Moving surfaces, Jet Efflux.

Significant Risks Ingestion into engine, Air intakes, contact with Propellers.

Associated Training Packages, Information Sources and Practical Training

Training Packages	Information Sources	Practical Training	Frequency
1 Aircraft Construction	Student Note (SN) Aircraft Construction	Basic Firefighting Course	
2 Aviation Fuel and Fuel Systems	SN Aviation Fuels	Firefighting Course	
3 Extinguishing Agents	SN Extinguishing Agents	Aerodrome practical exercise scenarios 1,5,7,9 etc	
4 Halon, Dry Powder, CO_2	SN Aircraft Tactics & Techniques	Hot Fire Training	
5 Application of Extinguishing Agents	SN Health & Safety Risk Management	Combined Exercises Local Authority Fire Brigade	
6 Tactics & Techniques	Aerodrome Operating Manual/ Procedures	First Aid/Casualty Care	
7 Aerodrome Operations Manual	Student reports from basic and firefighting courses		
8 Health & Safety Continuation training	Student station records		
	CAP 168/700/642		
	Home Office Fire Service Manual, Volume 2, Aircraft Incidents		

Key Roles

- Supervisor
- Driver
- Pump Operator
- BA Wearer
- First Aid
- Firefighter
- Entry Control Officer

Operational Procedures

Aerodrome Manual etc.

Aim

- To determine the correct method of branch handling and dual application of media on pressure fed fuel fires.

Objectives

- Determine the correct method of approach.
- Predict the effectiveness of various methods of media application.
- Identify the correct method for personal protection.
- Compare the effectiveness of various complementary agents in dual application.
- Demonstrate various methods of attack in dealing with engine fires.

Assessment Methods

- Direct Observation
- Debrief using direct and indirect questioning methods
- Checking of personal and station recording systems

Performance Outcomes

Unit 1	Unit 2	Unit 5	Unit 6	Unit 7	Unit 3	Unit 10
Element 1.2 1,2,3,4,5,6,7	Element 2.1 1,2,3,4,5,6,7	Element 5.1 1,2,3,4,5	Element 6.1 1 to 10	Element 7.1 1,2,3,4,5,6	Element 3.2 1,5,8	Element 10.1 1,2,3,4,5,6
Element 1.3 1,2,3,6	Element 2.2 1,2,3,4,5	Element 5.2 1,2,3,4,5	Element 6.2 1,2,3,4,5,6,7	Element 7.2 1,2,3,4,5,6,7	Element 3.3 1,5	
Element 1.4 1,2,3,4,5,6,7	Element 2.3 1,2,3,4,5	Element 5.3 1,2,3,4,5				

Example Documents

- Personal Log Book
- Driver Records
- Equipment Records
- Training records
- Supervisors Testimony
- Fire Report

Cross Referencing to TSCG Questionnaire 1996

01.1, 02.1, 2.5, 2.6, 6.1, 8.1-4,9.1-2,12.1-3,14.2-4,15.1-6,16.1-3,22.03-10,22.16,26.1-5,27.1-3 29.1-3,30.1-2,31.3,32,37 & 39

APPENDIX B

Audit Trail

Objective: To establish whether all candidates having taken Competence-Based Training have fulfilled the requirement of CAP 699

Information Required

(a) Unique Number (National Insurance number, prefixed with role eg. Fxxx, Sxxx, Mxxx.
(b) Personnel Name
(c) *Date of Birth*
(d) Date of entry into the RFFS
(e) Location of employment
(f) Date of Commencement, Initial Core Competence Training
(g) Date of Satisfactory Completion, Initial Core Competence Training
(h) *Examination Result*
(i) Level of Qualification – Firefighter, Supervisor, Manager
(j) Due date for re-certification of Core Competences
(k) Date of commencement, Progressive Training to Supervisor/Manager
(l) Date of satisfactory completion, Progressive Training to Supervisor/ Manager
(m) *Examination Result*
(n) Level of Qualification Confirmed – Firefighter, Supervisor, Manager
(o) Transfer into another employment/position/left employment (reference brought forward)

At each point of entry for data, track validation, i.e. who confirmed the candidate's record. Personnel records should be kept for at least 5 years after move or cessation of employment.

Items in italic print denote supplementary information only.

Part 4 Guidance on the process of Delivering Structured Learning Programmes for Aerodrome RFFS Personnel

CONTENTS *Page*

1 INTRODUCTION

1.1 This guidance should be read and used in conjunction with ICAO Training Manual Part A-1, General Considerations. The purpose of this guidance is to promote the uniform application of ICAO Standards and Recommended Practices Procedures, to assist licensees to establish structured learning programmes, and to encourage a high standard of professional competence.

1.2 Suggested curricula of Structured Learning Programmes for different levels of RFFS personnel are given, together with general points of training for duties in the aerodrome RFFS.

1.3 The relatively short duration of the Structured Learning Programmes enables them to be given in detail, period by period. For this reason, and since the elements of training are uncommon to other aviation disciplines, this guidance is self-contained. Reference is necessary only to other relevant ICAO or CAA documentation referred to in the Bibliography (CAP 699 Part 2 Section 12).

1.4 Audio-visual aids such as films, videos, slides, transparencies, and posters can be of great assistance in the training process, and particularly in this field of expertise. Due to the difficulty of keeping such support material up to date, the list of availability of these aids has not been included in this guidance.

1.5 There will be ready appreciation of the importance, not only of a high standard of *initial training* but of a thorough and *recurrent programme* designed to ensure complete familiarity with both the practical aspects of fire fighting and the equipment and aircraft likely to be encountered.

1.6 At the risk of stressing the obvious, the time element is of great importance in any type of fire fighting and assumes its greatest significance in the field of aircraft emergencies. Due to the very nature of aircraft operations, when hazards of great potential are always present, an emergency of major proportions can develop with startling suddenness. The immediate initiation of the correct actions for the particular circumstances, related to the aircraft type concerned, is essential to the successful fulfillment of the role of the RFFS. Every incident will possess unique difficulties, calling for the exercise of initiative in producing adequate solutions. Only thorough professional training can provide background knowledge, enable understanding and instil personal confidence which are the foundations for prompt and correct actions.

2 GENERAL

2.1 While the purpose of an aerodrome rescue and fire fighting unit may be simply defined as saving lives in the event of an aircraft accident, a more specific definition of the responsibilities would be to create conditions in which survival is possible and in which evacuation of the aircraft may proceed.

2.2 This necessitates the swift, efficient and correct performance of difficult tasks and the proper use of complex equipment, in a co-ordinated and coherent manner.

2.3 An acceptable level of performance will only be achieved after suitable, thorough training and must be maintained by an established programme of recurrent training.

2.4 The text in this section of the guidance deals solely with civil aircraft but in many localities the aerodrome facilities are also used by military aircraft, and it may be considered desirable to include some familiarisation with military type aircraft and their special features, e.g. ejection seats, as additional elements in the course. Knowledge of how to deal with military type aircraft is a necessary feature of a firefighter's expertise even when employed at an aerodrome not normally used by the military.

2.5 All training should be carried out on a *regular* and *programmed* basis to ensure that all subject matter is covered at the appropriate levels.

3 DESIGN AND ADMINISTRATION OF STRUCTURED LEARNING PROGRAMMES (SLPs)

3.1 There are several ways of establishing suitable RFFS SLPs and no attempt is made in this guidance to indicate that any particular organisation or system is preferable to another. The environment and facilities available will, to a large extent, dictate the type of organisation best suited to the particular case.

3.2 The various SLPs suggested do, however, give an indication of the different levels of competence, experience and training that are considered desirable.

3.3 It is essential to operate suitable recurrent training programmes at aerodromes. However, it must be recognised that only limited training may be achieved at the station level and many aspects of training may require the uninterrupted facilities of a dedicated training establishment. In particular, it is seldom possible to provide simulated operational incidents of realistic proportions at aerodromes and local training based on small fires can be dangerously misleading to inexperienced aerodrome firefighters.

3.4 The availability of suitable training aids with facilities for holding hot fire exercises is essential in providing efficient training courses.

3.5 Training Manuals

3.5.1 Technical magazines, books and training manuals should be made available to encourage private study. Personnel can easily produce training aids themselves; this not only enhances standards but also adds to the motivation levels of the persons involved.

3.5.2 Central sources may also produce training aids for retention by firefighters for long term reference.

4 TYPES OF AERODROME RFFS STRUCTURED LEARNING PROGRAMMES

4.1 Firefighter

4.1.1 This SLP should be attended by all recruits to the Aerodrome RFFS at RFF Category 3 aerodromes and above. The syllabus should include theoretical instruction in the causes of fire, principles of fire extinction, action of various extinguishing agents, construction and working principles of all types of appliances, practical operation of fire equipment provided by the licensee, elementary aircraft construction, methods of rescue from aircraft, including helicopters and other aspects of fire and rescue duties.

4.1.2 The course should provide essential practical training, the emphasis being on the tactical deployment of staff and appliances to achieve rescue from an aircraft involved in fire. All personnel will be required to undergo appropriate training in the use of breathing apparatus.

4.1.3 A number of simulated accidents should be staged during the SLP. Care and maintenance of appliances and equipment should be an integral part of the SLP. It is anticipated that the balance between practical and theoretical training on this course will be almost equally divided.

4.2 Firefighter (Revalidation)

The content of an acceptable SLP for Firefighter Revalidation SLP has been approved by the CAA for delivery by approved training providers. It will comprise the Performance Criteria (PCs) of the appropriate competences cross-mapped to the generic role of aerodrome Firefighter. The acceptable duration of this SLP at an approved training provider is expected to be no less than one week.

4.3 **Supervisor SLPs – Initial**
Crew Commander

4.3.1 This SLP should be attended by personnel employed at aerodromes where larger crews are to be expected and crew command may be required. The course should provide the opportunity to command a crew and consist of mainly practical fire/drill related command principles including breathing apparatus command and control procedures. Also included should be the control of standard tests and records.

4.4 **Supervisor SLP**
Watch Commander

This course should be attended by supervisory grades who have successfully completed a Supervisor (Crew Commander) SLP. The syllabus should deal comprehensively with most aspects of station administration and organisation and cover the planning of a balanced training programme, station records, discipline, aerodrome emergency orders, fire prevention (as appropriate), and up to date information on equipment design and development, and control of fires. Provision should be made for theoretical and operational exercises giving each student the opportunity of exercising fireground command.

4.5 **Supervisor (Revalidation) - Crew Commander/Watch Commander**

The content of acceptable SLPs for Supervisor Revalidation have been approved by the CAA for delivery by approved training providers. These will comprise the Performance Criteria (PCs) of the appropriate competences cross-mapped to the generic role of aerodrome Supervisor (Crew Commander/Watch Commander). The acceptable duration of this SLP at an approved training provider is expected to be no less than one week.

4.6 **Manager's Courses**
Station Commander – Initial

This course should be attended by all officers selected for promotion who have successfully completed a Supervisor (Watch Commander) SLP.The syllabus should be designed to acquaint officers with developments in the field of aircraft fire prevention, rescue and fire fighting, appliance design and handling, operational tactics and techniques as well as station and service administration and organisation.

4.7 **Grades of Courses**

The courses detailed herein are listed in accordance with the grades of courses which may be considered as suitable for the grades of RFFS personnel listed in the Classification of Occupations in Aviation given in Doc 7192-AN/857, Part A-1, General Considerations, Appendix 2.

4.8 Qualifications

4.8.1 The SLPs detailed in this chapter should only be carried out at training establishments approved by the CAA ('Approved Training Providers'). Each SLP should incorporate appropriate oral technical, practical and written technical tests, the qualifying standard to be set by the CAA.

4.9 Careers

4.9.1 Certificates of Competence shall be valid for the periods identified in CAP 168 Licensing of Aerodromes, Chapter 8 Section 14. All personnel should re-qualify by test following attendance on further courses appropriate to their grades.

5 RESOURCES

5.1 Publications

Many national associations dealing with fire prevention in general, and aircraft and aerodrome fires in particular, are in existence. These associations may all be requested for assistance as to the most suitable text books, technical pamphlets, training notes, demonstration equipment and training aids available.

5.2 Audio-Visual Resources

Films, slides and photographs can play a very important part in the training and education of firefighters both at training school and at fire station level. These aids can also be of great assistance when training personnel from assisting agencies, and all personnel who take an active part in any aerodrome emergency organisation.

5.3 General

5.3.1 ICAO produces a catalogue of audio visual aids available and a copy may be obtained on request. Such aids are available at nominal cost.

5.3.2 ICAO Personnel Licensing and Training Practices Section will gladly assist in obtaining, or in advising on, the appropriate aids for assistance for any specific training requirements that may be encountered in a particular environment.

5.4 Practical Training Facilities

5.4.1 Practical training facilities shall be commensurate with the type and size of aircraft in use at the aerodrome so that RFFS personnel may regularly participate in live fire drills commensurate with the types of aircraft and types of RFF equipment in use at the aerodrome, including pressure-fed fuel fires.

5.4.2 Approved Training Providers (ATPs) shall be provided with training facilities similar to those in use at aerodromes licensed by the CAA to ensure that a representative number of realistic training simulations may be reproduced.

APPENDIX I

EXTRACT FROM AIRPORT SERVICES MANUAL PART I – RESCUE AND FIREFIGHTING THIRD EDITION – 1990 DOC 9137 – AN/898 PART 1

14 TRAINING

14.1 General

14.1.1 Personnel whose duties consist solely of the provision of rescue and fire fighting services for aircraft operations are infrequently called upon to face a serious situation involving life saving at a major aircraft fire. They will experience a few incidents and a larger number of standbys to cover movements of aircraft in circumstances where the possibility of an accident may reasonably be anticipated but will seldom be called upon to put their knowledge and experience to the supreme test. It follows, therefore, that only by means of a most carefully planned and rigorously followed programme of training can there be any assurance that both personnel and equipment will be fit to deal with a major aircraft fire should the necessity arise. Training of rescue and fire fighting personnel falls into two broad categories; basic training in the use and maintenance of equipment, and operational tactics training which covers the deployment of personnel and equipment to accomplish control of a fire to permit rescue operations to proceed. The latter aspect is described in 14.3.

14.1.2 The officer responsible for the training programme must endeavour to maintain the interest and enthusiasm of the crew at all times. In certain respect this will not be too difficult. There are many factors affecting rescue and fire fighting procedures at an aircraft accident which may be anticipated and staged and practised so that the officer has an opportunity of sustaining the interest indefinitely. Each new type of aircraft brings with it new problems which must be assessed and incorporated in the training programme. Other more routine aspects of training become less interesting over a long period and here it is essential that the officer should ensure that each crew member realises the need for such training. For example, it is a fundamental practice in the rescue and fire fighting service that each crew member, when on duty, be satisfied that the equipment which may be used is serviceable. This particular aspect of a crew member's duty could deteriorate after a long period of comparative inaction unless that person is really convinced of the importance of this task. The entire training programme must be designed to ensure that both personnel and equipment are at all times fully efficient. This represents a very high standard of achievement but anything less than full efficiency is not only not good enough but may be dangerous both to those in need of aid and also to those who are seeking to give such aid. Set out below are some suggestions of the type of training to be employed.

14.1.3 The training curriculum should include initial and recurrent instruction in at least the following areas:

(a) airport familiarisation;

(b) aircraft familiarisation;

(c) rescue and fire fighting personnel safety;

(d) emergency communications systems on the aerodrome, including aircraft fire related alarms;

(e) use of the fire hoses, nozzles, turrets and other appliances required for compliance with annex 14, volume 1, chapter 9, 9.2;

(f) application of the types of extinguishing agents required for compliance with annex 14, volume 1, chapter 9, 9.2;

(g) emergency aircraft evacuation assistance;

(h) fire fighting operations

(i) adaptation and use of structural rescue and fire fighting equipment for aircraft rescue and fire fighting;

(j) dangerous goods;

(k) familiarisation with fire fighters' duties under the aerodrome emergency plan; and

(l) protective clothing and respiratory protection.

14.2 ***Basic Training***

14.2.1 Fire and fire extinction*. All rescue and fire fighting personnel should have a general knowledge of the causes of fire, the factors contributing to the spread of fire and the principles of fire extinction. Only when armed with such simple knowledge can they be expected to take intelligent action when confronted with a serious fire situation. It must be known, for instance, that certain types of fire require a cooling agent while others need a blanketing or smothering action, and equally, that certain of the agents used extinguish by cooling, while others blanket or smother a fire. The scope of such instruction will vary with the degree of intelligence of the trainees. In most cases the simpler this form of instruction is kept, the more successful it is likely to be. In no case should enthusiasm engendered by the interest value of the subject be allowed to carry the instruction beyond its practical application.*

14.2.2 Types of extinguishing agents employed. *It is essential that a thorough knowledge should be acquired of the agents employed. In particular, every opportunity should be taken to use the agents on fires in order to understand by experience not only the virtues but also the limitations of each agent. Each occasion of a routine equipment test should be used for a training exercise in the proper handling of equipment and the correct application of the*

particular agent involved. The combination of routine test procedures with training periods will minimise the costs involved in the discharge of extinguishing agents.

14.2.3 Handling of equipment. *All rescue and fire fighting personnel must be capable of handling their equipment, not only under drill-ground conditions but also in rapidly changing circumstances. The aim must always be to ensure that every individual is so well versed in the handling of all types of equipment that, under stress conditions, operation of the equipment will be automatic. This can be accomplished in the initial stage of training by employing the snap "change-round" technique during standard drills, and later by training involving the use of two or more appliances simultaneously. Particular attention should be paid to pump operations. This form of training is, of course, a continuing commitment.*

14.2.4 Care of equipment. *A thorough knowledge of all equipment is essential in order to ensure its intelligent handling and to ensure thorough maintenance which is essential to guarantee operational efficiency under all circumstances. It is important that every fire fighter be satisfied that any piece of equipment which may be used will work satisfactorily and, in the case of ancillary equipment, that it is in its correct stowage position. The importance of correct stowage of small equipment to ensure that is can be instantly located cannot be over-stressed. Officers responsible for training are advised to hold periodic locker drills where individual crew members are required to produce a particular item immediately. All rescue and fire fighting equipment must be regularly tested or inspected and careful records must be maintained of the circumstances and results of each test. Some items of equipment can be repaired locally and training in such subjects should be provided.*

14.2.5 Local topography. *A thorough knowledge of the airport and its immediate vicinity is essential. The training programme should encompass those areas of operation dealing with:*

(a) thorough familiarisation of the movement area so vehicle drivers can demonstrate their ability to:

(1) select alternative routes to any point on the movement area when normal routes are blocked;

(2) know the existence of ground which may become from time to time impassable in any part of the area to be covered by the service;

(3) recognise landmarks which may be indistinctly seen;

(4) operate vehicles over all types of terrain during all kinds of weather. The training programme may be conducted using vehicles other than the rescue and fire fighting vehicles provided they are radio controlled and have similar operating characteristics;

(5) select the best routes to any point on the airport; and

(6) use detailed grid maps as an aid in responding to an aircraft accident or incident; and

(b) the use of guidance equipment when it is available. Normally air traffic control may be of assistance in providing information on the location of the accident site and position of other aircraft or vehicles on the airport which may obstruct or impair movement.

14.2.6 Aircraft familiarisation training*. The importance of this aspect of training cannot be over-emphasised. Rescue and fire fighting personnel may be called upon to effect a rescue from an aircraft cabin in conditions of great stress working in an atmosphere heavily leaden with smoke and fumes. If self-contained breathing apparatus is supplied, careful training in its use is essential. It is essential that every person have an intimate knowledge of all types of aircraft normally using the airport. Appendix 1 provides general information on principles of rescue and fire fighting procedures and detailed information of concern to rescue and fire fighting personnel on representative aircraft. This knowledge cannot be acquired solely on a study of the diagrams at appendix 1. There is no substitute for a periodic inspection of the aircraft. Due to the complexity of modern aircraft and the variety of types in service, it is virtually impossible to train rescue and fire fighting personnel on all the important design features of each aircraft although they should become familiar with the types normally used at the airport. Information about the following design features is of special importance to rescue and fire fighting personnel to ensure effective use of their equipment:*

(a) location and operation of normal and emergency exits;

(b) seating configuration;

(c) type of fuel and location of fuel tanks;

(d) location of batteries; and

(e) position of break-in points on the aircraft.

14.2.7 As far as is practicable, rescue and fire fighting personnel should be allowed to operate the emergency exits and should certainly be fully conversant with the method of opening all the main doors. Generally speaking, the majority of the doors open forward. Some containing stairs will swing downward and, on some wide-bodied aircraft, the doors retract into the ceiling area. Most large aircraft are fitted with inflatable emergency evacuation slides affixed to cabin doors and large emergency exit windows. If the units are not automatically disengaged, or if the system equipment malfunctions, the slides may become inflated when the exit is opened. The doors of large aircraft are normally operated from the inside. There are occasions, however, when responding rescue and fire fighting personnel may have to open doors from the outside of the aircraft to gain access to the cabin interior. In view of the variables noted above, the opening of the normal and emergency exits may be hazardous for the airport fire fighter if the appropriate cautionary measures are not taken. For example, it is hazardous to open the majority of aircraft doors if the fire fighter is standing on a ladder or to rest the ladder against the door to be opened.

14.2.8 Aircraft operators and flight crew members should be requested to co-operate to the fullest extent in arranging inspection by rescue and fire fighting personnel of the different types of aircraft using the airport. An elementary knowledge of aircraft construction is highly desirable since such knowledge is invaluable if, as a last resort, forcible entry is necessary. The co-operation of the appropriate staff of the airline operators should be sought on this aspect of training.

14.2.9 All aircraft carry small portable fire extinguishers that could be of possible use to rescuers. Extinguishers containing carbon dioxide, a halon agent or water are usually located on the flight deck, in galleys and at other points within the cabin. All extinguisher positions are indicated and the extinguisher body normally carries a label stating the type of fire for which its contents are suitable. Water and other beverages found in the buffet compartment provide an additional source of water for extinguishment purposes. It should be emphasised that these extinguishing agents are of secondary value and should not be relied on.

14.2.10 Medical first aid. *Every member of the rescue team should, if at all possible, be trained and periodically re-qualified in medical first aid. The prime reasons for this qualification is to ensure that casualties are intelligently handled so as to avoid the infliction of additional suffering and/or injury in the removal of the occupants from a crashed aircraft.*

14.2.11 Search and rescue. *The training programme should provide instruction in search procedures, not only in enclosed spaces of an aircraft, but also for procedures for systematic searching of the area in immediate vicinity of an aircraft accident and also in the path of the aircraft. As a broad principle, it should be taught that the persons involved in a fire are most frequently found near an exit, i.e. Doors and windows, or will have sought shelter, however inadequate, in cupboards and lockers, etc. Rescue is always best effected by way of a normal channel, if available. For example, it is easier to carry a person through a doorway that to manipulate that person through a window. The main cabin door of an aircraft should always be attempted first. Should the door be jammed, it will usually be found quicker to force it by applying leverage at the right spot than to achieve entry and rescue through another form of opening. Success in this form of operation requires a full knowledge of the locking mechanism and direction of travel of the door concerned. Only when everything else has failed should forcible entry be attempted. External markings are now provided on many aircraft showing suitable points at which entry can best be effected.*

14.2.12 Pressurised cabins will offer tough resistance to penetration by an axe, although entry can be made by a person well trained in the use of an axe and possessing a working knowledge of aircraft construction. The practice of providing power-operated saws on all airports normally handling this type of traffic has increased. All staff should be trained in rescue procedures. The working space inside a cabin is necessarily somewhat restricted and it will generally be found advisable to restrict the number of rescuers working inside the aircraft and to work on a chain principle. Where possible, the airport emergency plan should provide for the availability of staff other than rescue and fire fighting personnel, for the handling of casualties from the moment they are removed from the aircraft. All rescue staff should be trained in the fire fighter's lift and other forms of rescue.

*14.3 **Operational Tactics***

14.3.1 When personnel are well versed in the handling of fire fighting equipment they should receive training in operational tactics to be adopted at aircraft fires. This training is a continuing commitment and must be absorbed to the point where compliance with the initial action called for is automatic, in the same sense that hose-running to a well-trained regular fire fighter is automatic and will, therefore, follow even when working under stress. Only when this is achieved will the officer-in-charge be in a position to assume complete control of the situation. Operational tactics training is designed to deploy personnel and equipment to advantage in order to establish conditions in which aircraft occupants may be rescued from an aircraft

which is involved in, or liable to become involved in, fire. The object is to isolate the fuselage from the fire, cool the fuselage, establish and maintain an escape route and achieve the degree of fire control necessary to permit rescue operations to proceed. This is fundamental and must be stressed in the training programme. The service to be provided is primarily a life saving organisation, one, however, that must be trained in fire fighting because aircraft involved in a serious accident are frequently involved in fire. The fire fighting operations must be directed to those measures which are necessary to permit rescue to be carried out until all occupants of the aircraft are accounted for. This includes precautionary measures at those incidents where no fire has broken out. When the life saving commitment has been met it is necessary, of course, to utilise all available resources to secure protection of property.

14.3.2 The main attack on the fire should usually be by means of mass application of foam in an endeavour to achieve maximum cooling and the rapid suppression of the fire. Since, however, foam, like every other agent, has limitations, as suitable back-up agent must be available to deal with those pockets of fire which are inaccessible to direct foam application. This will generally be provided in the form of dry chemical powder or halon extinguishing agents. The use of these should be confined to running liquid fuel fires, fires in enclosed spaces such as wing voids, or for dealing with a special fire such as a fire in an engine nacelle or undercarriage well.

14.3.3 Points which should be covered in the operational tactics training programme are described below.

14.3.4 The approach. *Equipment should approach the accident site by way of the fastest route in order to reach the site in the shortest possible time. This is quite frequently not the shortest route as, generally speaking it is preferable where possible to travel on a made-up surface than to approach over rough ground or grassland. The essence is to ensure that rescue and fire fighting vehicles get there and are not subjected to unnecessary hazards en route. When nearing the scene of the accident a careful watch must be maintained for occupants who may be dashing away from the aircraft or who may have been flung clear and are lying injured in the approaches. This applies particularly at night and calls for intelligent use of spot or search lights.*

14.3.5 Positioning of equipment. *The positioning of equipment both from the airport and from any supporting local fire department is important in many respects and regard should be given to several factors. Correct positioning of equipment must permit the equipment operator an over-all view of the fire area. The equipment must not be placed in a position of hazard due to fuel spills or ground slope or wind direction. It must not be positioned too close to the fire or to other equipment and thus restrict working space (this applies particularly to foam tenders and their attendant auxiliary water tenders). Other factors which should be taken into account are the location of aircraft occupants relative to the fire, relationship of wind, fire, personnel and fuel tanks and location of emergency exits.*

14.3.6 In certain circumstances it may be advantageous to leave the equipment on hard standing, though this may mean an additional length of hose. More time can be lost attempting to reach a closer position to the fire by negotiating rough ground than would be taken to run an additional length of hose. Moreover, if parked on hard standing the equipment is capable of being moved rapidly if conditions demand. Aircraft accidents frequently occur in circumstances where equipment cannot be positioned in the immediate vicinity. Consequently

it is recommended that all fire fighting and rescue equipment should be designed so that it can be brought to bear at some distance from the parental equipment. Operational tactics training can do much to reduce the problems of positioning equipment, can be conducted at very little cost and should be performed frequently to develop acceptable practices. For this particular phase of operational tactics training it is not always necessary to produce water or foam; it is an example of how "dry drills" can help to raise efficiency standards.

14.3.7 In order to achieve the main initial object of isolating and cooling the fuselage and to safeguard the escape route it is evident that the positioning of foam streams is of the utmost importance. The number of streams available will vary with the type and the scope of the equipment provided.

14.3.8 Foam streams should be positioned as close as possible to the fuselage, the initial discharge being directed along the line of the fuselage and then directed to drive the fire outwards. When selecting the ideal position for the stream it should always be remembered that the wind has considerable influence upon the rate of fire and heat travel. The position should be chosen with this in mind, thus utilising the wind, whenever possible, to assist in the main objective. Except in exceptional circumstances, foam streams should not be directed along the line of the wind towards the fuselage as this may tend to flush free fuel into the danger area. Similarly, care must be exercised to avoid the possibility of one stream disturbing the foam blanket laid down by another stream.

14.3.9 There are two basic methods of applying foam. One is to use a long straight stream to allow the foam to fall on to the desired area. The other is to apply a diffused stream at close range. Often foam can be applied to a fire area by deflecting it from another surface such as the contour of the fuselage or main plane. Whenever foam, dry chemical of halon equipment is being subjected to a periodic routine check, the opportunity should be taken to train emergency crew members in the methods of application. It is important that this be carried out on a fire so that each person will obtain an assessment of the value, as well as the limitations, of each agent so applied, and be familiar with the heat conditions that will be experienced. These drills should be carried out at intervals of not more than one month. The tendency in the more recent fire fighting equipment design is to provide high output monitor/turrets to deal with accidents involving the very large aircraft currently in service. Monitor/turret operators must be highly skilled in the application of foam to be able to avoid wastage, through misdirection of aim, to know when to change from straight stream to diffused stream, and to readily appreciate how to avoid damage or injury to others by the potential force of the foam stream.

14.3.10 Officers responsible for training should decide which particular pattern of equipment positioning is best suited to their available resources and then take steps to train crew members in its positioning and layout. At a fire there is little time for individual briefing of crew members and the initial layout may well have to be adjusted to cope with the existing circumstances, but it is necessary for the crew members to know exactly what their first action should be well in advance. It should always be remembered that this layout of equipment should be standard practice at an aircraft accident even when fire has not broken out and that at least one monitor/turret should be staffed and in readiness to go into instant action should the occasion arise.

14.3.11 The main objective of the fire fighting activity must be to subdue the fire and secure it against re-ignition in the shortest possible time. This demands skill, teamwork and understanding by all those involved. The first responding vehicle may carry agents which can achieve some rapid knockdown of an area of the fire, but this will in most cases require the early support of any other vehicles to continue the effort and secure the entire area against re-ignition and to promote the necessary cooling effect in the vicinity of the passenger compartment. The entire effort must be concentrated on this area since the misapplication of foam or other agents is wasteful and could mean the difference between the success of failure of the operation. Where foam production through a monitor/turret is undertaken with the vehicle in motion, considerable skill is required to achieve maximum effect.

14.3.12 Great care must be exercised by monitor operators in the application of foam in straight streams in the vicinity of escape slides deployed from the aircraft. Rescue and fire fighting personnel must also anticipate that escaping occupants may become distressed and disoriented by the presence of dry chemical powder clouds or by the impact of foam streams and should conduct their operations so as to minimise these effects.