Guidance for Compartment Fire Behaviour Training

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Background

This guidance has been developed, as part of a series of documents, to assist Fire Authorities in the delivery of Compartment Fire Behaviour Training (CFBT). Associated documentation includes:

- National Standard for CFBT;
- Lectures in PowerPoint format to support CFBT; and
- Competency based Assessment Sheets for CFBT.

Purpose of Compartment Fire Behaviour Training (CFBT)

One of the significant hazards facing firefighters involved in tackling fires in buildings, as well as other occupants of the buildings concerned, is the possibility of a sudden increase in the burning rate and severity of fires through phenomena such as flashover or backdraught.

In order to ensure that firefighters are adequately trained and equipped to perform their roles effectively and safely, they should be able to recognise the behaviour of fires, assess conditions in a compartment and make decisions on whether to undertake firefighting in a compartment, and respond appropriately.

The aim of Compartment Fire Behaviour Training (CFBT) is to enhance the effectiveness and safety of Fire Authorities’ firefighting activities. This document sets out guidance for Compartment Fire Behaviour Training dealing with fire behaviour in single-compartment spaces.
Aims and Objectives of Compartment Fire Behaviour Training (CFBT)

Compartment Fire Behaviour Training builds on the learning outcomes achieved during training in the use of Breathing Apparatus (BA). At the end of Compartment Fire Behaviour Training, successful participants will have strengthened their understanding of the following areas and reinforced the associated skills:

- Understand the principles of combustion and compartment fire behaviour;
- Understand how fire develops and spreads within a compartment and how it can be extinguished;
- Understand and demonstrate the appropriate extinguishing techniques, cooling techniques and ventilation techniques; and
- Demonstrate the appropriate entry techniques, recognise the hazards and risks within the environment, and apply the appropriate tactics.

Competence in Compartment Fire Behaviour Training (CFBT)

Compartment Fire Behaviour Training must be viewed therefore as an educational process which provides the essential foundations of knowledge, skills and understanding in relation to the dynamic process of fire development and behaviour in a particular environment i.e. within a compartment. This will be underpinned and reinforced by firefighting training skills equipping firefighters to effectively respond to fire situations appropriately.

To achieve this ability training has to be realistic. Compartment fire training must involve fire within compartments. To balance between the risks of training and benefits to be achieved by realism, appropriate supervision, safeguards and controls should be in place, so that training is as safe as reasonably practicable. The intention of this guidance is to assist fire authorities to provide effective and safe Compartment Fire Behaviour Training. Fire Authorities should be aware of the context of CFBT within the range of training undertaken by operational personnel.
Training in compartment fire behaviour and fire fighting should not be confused with other heat and smoke training, carried out as part of training in the use of breathing apparatus, which has different training aims and objectives – associated with acquiring skills necessary for use of breathing apparatus in the Fire Service.


Practical compartment fire behaviour and firefighting training, conducted in a controlled environment, allows personnel to contribute to their own safety and the safety of others.

Compartment Fire Behaviour Training allows firefighters to develop:

- confidence to assess and deal with compartment fires;
- responsibility for their own safety and safety of others;
- self discipline; and
- confidence in personal protective equipment (PPE), ancillary equipment and fire fighting equipment.

Compartment Fire Behaviour Training is generally carried out using steel containers, designed for the purpose. The training involves fires set in the containers, typically using wood-based fuel; this allows characteristics of a compartment fire to be realistically and consistently reproduced, and also facilitates control of the duration of fires.

Training benefits are achieved by controlling the fire, not extinguishing it; this allows the most effective use of each exercise (“burn”) as an opportunity for teams of learners to control conditions, under the supervision of instructors. Instructors should ensure that this is understood by learners.
Training Delivery

To achieve the Compartment Fire Behaviour Training needs, the following factors should be considered:

- site facilities;
- instructor requirements;
- learner requirements; and
- safe systems of work – as set out in this document.

Uniformity and consistency will ensure that training provided will be:

- accurate;
- appropriate;
- likely to reduce injury at incidents; and
- consistent with other Fire Authority training.
Section 2 - Learning Outcomes

Introduction

As with any other training, it is essential that Compartment Fire Behaviour Training is designed to meet operational needs. This can be achieved using the unit content from the relevant national standard.

The following is contained in the national training standard for training for firefighters.

Unit content - Compartment Fire Behaviour Training

- Understand the principles of combustion and compartment fire behaviour.
  (see PowerPoint CFBT 01)

Combustion:

Triangle of fire (interaction of heat, fuel and oxygen);
Extinguishing fire (starvation, smothering, cooling);
Heat transmission (conduction, convection, radiation);
Pyrolysis;
Chemistry;
Products (flammable gases, non-flammable gases, air and soot).

Compartment fire behaviour:

Combustible gases;
Limits of flammability (lower & upper explosive limit, ideal mixtures);
Ignition (flash point, fire point, spontaneous ignition temperature)
Sources of Ignition;
Fire gases;
Types of flame (pre-mixed, diffusion);
Gas flow (laminar, turbulent).
• Understand how fire develops and spreads within a compartment and how it can be extinguished.

(see PowerPoint CFBT 02)

**Compartment fire development:**

Terminology, i.e. air tract, under pressure, over pressure, neutral plane;
Stages of development (growth, flashover, fully developed, decay);
Processes (smouldering fires, backdraught, fire-gas ignition).

**Compartment fire spread:**

(see PowerPoint CFBT 03)

Factors affecting flame spread, initial fire;
   Surface direction,
   Material thickness,
   Material density (principle of thermal capacity),
   Surrounding environment (concept of combustion inhibitors).

Effects of insufficient fuel.
Effects of limited ventilation;

Factors affecting fire growth:
   Compartment construction;
   Compartment size;
   Fire loading;
   Location of fire;
   Changes in fire environment;
   Ventilation.

Fire spread to adjacent compartments;
Extinguishing theory and methods:
(see PowerPoint CFBT 04)

Use of water (effects of steam);
Extinguishing techniques;
   Direct cooling;
   Indirect cooling;
   Gas cooling;
Latent heat of fusion/vaporisation.

Dynamic Risk Assessment (temperature checks);
Tactical deployment;
Compartment definition.

• Understand and demonstrate the appropriate extinguishing techniques, cooling
techniques and ventilation techniques.
(see PowerPoint CFBT 05)

Extinguishing techniques:

   Direct and indirect;
   Over-pressure and under-pressure.

Cooling techniques prior to entry:

   Gas cooling using spray;
   Cooling of the fire room compartment from the adjacent compartment;
   Use of water spray to paint the wall linings to prevent further pyrolysis.
**Ventilation Techniques:**

Natural ventilation techniques in compartments adjacent to the fire room compartment.

- Demonstrate the appropriate entry techniques, recognise the hazards and risks within the environment, and apply the appropriate tactics.

**Entry techniques:**

Locating the fire;
Reading the stage of fire development;
Securing the area around the fire compartment before entry;
Cooling techniques to the fire compartment from adjacent compartment before entry;

**Recognise Hazards and risks within the environment:**

Neutral plane combustible gas layers’ horizontal positions;
Smoke characteristics;
Position of flame fronts exiting the fire compartment;
Velocity of the gravity current.

**Dynamic Risk Assessment:**

Carry out Dynamic Risk Assessments;
  - when to enter,
  - when to advance,
  - when to withdraw,
  - when to hold position (with a view to improving conditions).
Training Scenarios

The full range of training scenarios which may be undertaken at a facility must:

- Be set out in detail in the operating instructions for the facility alongside specific safety criteria for maintaining the integrity of the facility;

- Be risk assessed and have been completed for all training scenarios planned;

- Have the identified specific training scenario precautions to be implemented, addressed; and

- Ensure standards are actively monitored and procedures regularly reviewed and revised as necessary.

Guidance for Instructors

This unit can be delivered through a combination of classroom and practical sessions; it is based on a balance of theory and practical exercises. The main delivery methods used will be formal lectures, presentations and practical exercises. These methods may be reinforced by using video presentations.

It is anticipated that learners will be fire service staff with a working knowledge of fire fighting operations and new entrants to the fire service who have already completed basic fire training and are now moving on to specialist training.

There are also a variety of experiments which can be carried out during the course of teaching this unit to reinforce understanding of the learning outcomes.
Examples of experiments and exercises which could aid the delivery of this unit are:

- Flask experiment with wood chips and polystyrene;
- Candle and flame experiment;
- Flammable range Bang Box experiment;
- Gas aquarium experiment;
- Fire growth demonstration/container session;
- "Cheshire Box" backdraught demonstrator;
- Dolls' House
- Window container session; and/or
- Attack exercises using carbonaceous CFBT facility.

The experiments should be delivered in a practical setting and could involve demonstrations in either a classroom type setting or in the open air.

The knowledge gained in the classroom, during practical demonstrations and during practice sessions should generally be applied in carbonaceous CFBT training simulators. Creating the required, safe, simulated environments will help learners to understand how these operational techniques and procedures can be applied.
Section 3 - Infrastructure and Equipment

Introduction

The following issues may need to be addressed in the design and development of CFBT facilities:

- Site Issues
- Welfare of Personnel
- Environmental issues
- Training Area
- Fire Compartment
- Temperature Monitoring (to include documentation)
- Ventilation
- Commissioning (to include documentation)
- Documentation
- Hand-over
- Management Systems
- Maintenance
- Firefighting Equipment
- Life Span
- Realism of Scenarios

Site Issues

Experience has shown that early consideration of some of the following issues can assist in progressing the design and development of CFBT facilities:

- Consultation with neighbours and other interested parties
- Adequate site access (fire appliances/construction traffic)
- Site requirements to provide for the training events e.g. hard standing, water supply, room for welfare facilities, a shelter structure, proximity to classroom facilities, etc.
- Proximity to other buildings
- Drainage and water supply systems, ground contours, vegetation, boundaries and footpaths, roads, etc.
Environmental Considerations

Environmental considerations will affect the design and type of facility which can be used and its location. Items to be considered include:

- The potential emissions.
- The location of the planned facility in relation to boundaries, etc.
- The prevailing winds, average wind strength and potential gusting.
- The site and facility drainage.
- Noise.
- Visual issues, including flames, smoke and screening.
- Timing and frequency of the use of the facility.

The location of CFBT facilities is generally in remote areas to reduce the nuisance factor of smoke emission. This in itself poses problems in respect of the welfare requirements for personnel undertaking the training. Consideration must be given to the provision of (on-site or off-site):

- Adequate shower/toilet and changing facilities for all users.
- Hot and cold running water and drinking water.
- Covered rest areas including facilities for fluid intake adjacent to training facilities.
- Accommodation for clothing and drying facilities.
- Effective PPE cleaning facilities.
- Fuel container (for dry storage of fuel).

Training Area

The chosen site should be of sufficient size to enable the training activities and the estimated level of learner and instructor numbers to operate, access and egress safely.
Fire Compartment (container)

A Compartment Fire Behaviour Training facility and all of its fittings should be appropriately designed to function correctly at the operating temperatures required. The chosen temperatures shall have regard to providing a safe training experience and be appropriate for the PPE provided.

A fire compartment consists of two distinct areas, the fire area and the training area. The fire area is designated as the part of the compartment in which the training fire is initiated and should be of an adequate size to safely accommodate the fire at its maximum projected training size. It should be built of materials which will maintain structural integrity, stability and fire resistance.

The training area is designated as the part of the compartment in which instructors and learners will operate during training. It should be of an adequate size to safely accommodate personnel undertaking the specific training scenarios without impinging upon the fire area. It should be built of materials which maintain structural integrity, stability and fire resistance.

Temperature Monitoring.

Temperatures should be as low as reasonably practicable to achieve the training objective. In general terms, average temperature levels in compartments of 250°C at 1.5 metres should not be exceeded without an in-depth, specialist risk assessment on the effects on personnel, structure, equipment and plant.

All Compartment Fire Behaviour Training exercises should have continuous temperature monitoring during wears. A probe for measuring temperatures within the container should be located at head height for kneeling learners approximately 1.5 metres above floor level.

Temperatures measured within the container should be recorded. This can include a data logger capable of being downloaded to a computer which may produce temperature / time graphs as part of records. This has the added advantage that these can be shown to firefighters to demonstrate how proper firefighting techniques can control temperatures within the compartment.
Temperature records (and graphs if available) are also records for the fire authority and should be maintained on file.

Data loggers can have a facility for setting a maximum working temperature and this can be connected to an audible alarm to give instructors a warning to pause an exercise in the case of excessive temperature, and bring temperatures down to acceptable levels before re-commencing the training exercise.

**Ventilation**

The ventilation system must be designed to ensure effective combustion, rapid removal of hot fire gases and smoke and prevent the accumulation of dangerous quantities of unburnt fuel gases. Ventilation openings provided must be sized according to the specification of the fire compartment and located at positions within compartments to ensure that adequate fire gas egress capacity is achieved. For standard containers the recommended vent size is 750mm x 750mm.

Where possible, any vents should be operated in a manner which is simple, direct and of a ‘fail to safety’ design. Operating positions should be located at appropriate positions to the compartment as identified through risk assessment.

**Commissioning**

A commissioning protocol should be discussed during the design stage and be documented. The user should ensure that during commissioning the following issues are covered in documentation:

- Record of 'as built' drawings and plans produced and maintained throughout the construction process along with the specific design criteria;
- General details of the construction method and materials used;
- Details of the structure's equipment and maintenance facilities;
- Maintenance procedures and requirements for the structure;
- Details of the location and nature of utilities and services including emergency systems;
- Details of the on-going performance of the structure; before use and during operation including details of fuel load used and thermal records; and
- Training in the use of the facility for fire authority personnel, including instructors and operators.

During the commissioning process, consideration must be given to the duty of care for all those involved and particularly the provision and use of adequate PPE for Fire Service personnel and contractors.

**Handover**

Once the facility is commissioned and the initial operator training completed, a formal documented hand-over of responsibilities is recommended.

**Management Systems**

A full and detailed risk assessment should be carried out for each training scenario to be undertaken in the facility to include:

- Fuel supply.
- Start up / close down procedures.
- Access / Egress.
- Facility safety checks.
- Training scenarios and safety briefings.
- Maximum operating temperatures for various scenarios.
- Exercise log.
- Temperature monitoring.
- Defect/remedial work recording.
- Maintenance.
- Details of instructors.
- Competence and numbers of learners.
- PPE.
- Emergency measures and first aid.
**Maintenance**

A maintenance regime identifying specific areas of responsibility is essential for the continued safe operation of the facility following commissioning. Depending on use, specific areas covered will be inspected / maintained regularly, either daily, weekly, monthly or at other specified time periods and will comprise areas such as:

- Structural integrity.
- Door / window operation.
- Vent / exhaust fan operation.
- Thermal monitoring devices.
- Fire fighting provision.

It is important that the only risks that are presented by the facility are those relevant to the training experience. For example, CFBT facilities are prone to heat damage, particularly warping. It is important to take account of this in the design of the facility to guard against, for example; doors and windows jamming, structural failure, etc. Heat from fires may also be readily conducted to the outside surface of the units with a consequent burn risk to those outside the container.

Once the need for a training event has been identified Fire Authorities need to risk assess the training activity.

The routine maintenance of CFBT facilities is an essential part of normal good housekeeping, which will ensure safe and trouble free operation for the life of the equipment. Before use an instructor should be designated to pay particular attention to the following items that require routine adjustment, inspection, lubrication and maintenance:

- Compartment side-walls for damage, distortion or holes.
- Fire loading and securing chains for damage, distortion or wear.
- Door hinge pins, check for ease of operation and lubricate.
- Door locking bars, check for ease of operation and lubricate.
• Thermal monitoring equipment diodes should be checked for damage, cracks and security, to ensure that they operate within specified parameters.
• Floor for cracked, damaged, dangerous or loose tiles.
• Vent and cross shaft, check for ease of operation or the need to lubricate.
• Vent control linkage and handles, check for ease of operation or lubrication.
• Roof and compartment end panels for damage, distortion or holes.

Any damage or defects should be marked indicating the defect, then brought to the attention of the nominated 'responsible person' (CFBT instructor) for examination and rectification as soon as possible.

CFBT instructors are advised of the inherent danger in inspection or incorrect use of this equipment by unqualified staff. They must exercise their 'duty of care', ensuring that the approved practices and procedures outlined in this document, or in the various training centre documents are followed at all times. Failure to observe these safe practices could lead to serious damage or personal injury.

In addition the above items should be inspected on an annual basis against design specifications and performance criteria.

**Firefighting Equipment**

**Pumps**

Each Compartment Fire Behaviour Training exercise should have a designated pump operator.

Each exercise should have at least two separate water tenders available, to provide two separate water supplies. One supply should be for use of learners, and the other supply for instructors’ use (safety line). The tenders should be located close together, so as to be under the control of the single pump operator.
For optimum performance, pumps should be capable of operating to a minimum high pressure to low pressure ratio of 3:1. This ratio is necessary for this training because on some exercises instructors will require the use of both high pressure and low pressure at the same time from a single pump.

Pumps used in Compartment Fire Behaviour Training should be fitted with pressure relief, to avoid damage arising from pulsing at branches.

**Branches**

High-pressure hose reel branches should be capable of producing 115 litres per min, with mean droplet size of 0.3mm.

Low-pressure delivery branches should be capable of producing 360 litres per min, with droplet size 0.3mm.

Both hose reel and delivery branches should be capable of producing narrow and wide sprays.
Section 4 - Instructional Staff

Introduction

Compartment Fire Behaviour Training should be delivered by instructors who have successfully completed a Compartment Fire Behaviour Instructor Course. Fire Authorities should monitor instructor competence to include guidance that may be issued from time to time by the National Directorate in line with specified national standards. Instructors require training in safe operational of CFBT training systems, the safe use of facilities provided in training locations and in the delivery of technical and practical training.

Provision of instruction in Compartment Fire Behaviour Training can be physically demanding, and the level of activity expected of instructors should be monitored and reviewed. Instructors should be restricted to a maximum of two wears per day, with an interval of at least three hours between wears. The duration of wears should not exceed the working duration of one breathing apparatus cylinder.

Where an ongoing programme of Compartment Fire Behaviour Training is underway, respite periods should be included in the instructors’ schedule. If an instructor completes two Compartment Fire Behaviour Training courses in succession, there should be an interval of at least one week before the instructor is involved in further Compartment Fire Behaviour exercises.

It is recommended that Compartment Fire Behaviour Training be provided using a minimum of four (4) instructors. While the number of instructors relates to roles performed during exercises, a corresponding ratio of eight (8) students has been found to maximise the learning benefits for students during exercises. Extra students on exercises will not affect safety but will reduce the number of possible visits students can make to the container.

Additionally, a pump operator should be assigned for each wear.
Medical Examinations

Instructors should be operationally fit to carry out Compartment Fire Behaviour Training. Medical examinations should be in accordance with the National Occupational Health System (or similar) repeated annually and continued for a period of three years after an instructor has ceased Compartment Fire Behaviour Training.

Monthly Self-Monitoring

Compartment Fire Behaviour Instructors (actively providing training) should monitor themselves on an ongoing basis for unusual symptoms that may be related to their Compartment Fire Behaviour Training activities.

Fire Authorities should consider the provision of an ear temperature probe with disposable covers for use by instructors while providing Compartment Fire Behaviour Training. A record of temperature readings should be maintained in line with Section 12 of this document.

Core Body Temperature

The key research findings of the UK Building Disaster Assessment Group (55/2004) included information on core body temperature which was defined as an individual’s internal body temperature which is normally about 37°C. If this temperature exceeds 40°C, heat stroke can occur. This is a life threatening disorder requiring immediate medical attention. Long-term injury may also result.

The duration and intensity of work undertaken, Personal Protective Equipment and Respiratory Protective Equipment worn, and ambient environment all affect the rate of rise of core body temperature. In addition excessive core body temperature limits the duration of work which can be undertaken without rest and recuperation.
Greater physiological demands of an activity mean a greater likelihood of firefighters exceeding core body temperature. Conversely, research shows that working at low levels of intensity in Gas Tight Suits (e.g. walking to reach and isolate a leaking valve or conducting mass decontamination operations) firefighters can operate for longer periods without harmful physiological effects or exceeding temperature limits.

The total physiological load of activities undertaken is a key issue. If firefighters have undertaken demanding activities prior to being deployed in breathing apparatus this will reduce their effectiveness, while increasing the likelihood of harmful effects.

Fire Authorities should consider the following both in training and operationally:

- Wherever appropriate, and subsequent to the findings of a dynamic risk assessment and review, “dressing down” of PPE, to allow for the venting of body heat and the reduction of the resulting physiological burden, should be a normal procedure pre- and post-deployment;

- Observation of specific individuals after exposure to high temperatures, especially if it is suspected that an operational firefighter is suffering from any heat disorder;

- Where heat strain is identified or suspected the individual(s) should dress down and drink cool water. If possible warm, not cold, water should be sprayed onto the affected individual(s) and they should be fanned to aid in the process of cooling by evaporation. Special consideration should be paid to head cooling. Wrist cooling with cool water also aids in core temperature cooling but acts more slowly than the methods identified above;

- It is important that operational staff maintain fitness levels appropriate to their role.

- The selection and use of PPE and RPE should aim to reduce unnecessary physiological load.
Hydration

When undertaking demanding physiological activities, perspiration loss rates were found to have negative effects on performance and health, especially after one hour’s working duration. The level of hydration of the individual impacts upon physiological performance of current and subsequent tasks and the subsequent work/rest schedule. Dehydration can be a problem during short and long duration operations, especially in high ambient temperatures.

Fire Authorities should consider the following:

- The need to have adequate water available to firefighters; and to encourage them to drink regardless of thirst when operating in high temperatures or at high levels of energy expenditure;

- Incorporating a regime for effective fluid intake, which is critical in preventing the ill-effects of dehydration; and

- Arrangements for ensuring adequate levels of hydration and rehydration are included in operational practices. Daily water requirement can be as high as 5 to 15 litres per day, depending on work level, duration and temperature.

Personal Protective Equipment (PPE)

The following personal protective equipment should be worn by instructors:

- Fire fighting tunic BS EN 469 (2005) - tunics should have thumb loops.
- Long sleeves non-synthetic clothing to be worn under the fire fighting tunic.
- Fire fighting leggings BS EN 469, incorporating padded knees.
- Knee pads.
- Fire Helmet BS EN 443.
- Breathing apparatus BS EN 137.
● Water-proof gloves BS EN 659, with thermal lining.
● Anti-Flash hood (shoulder length) BS EN 13911 - standard issue 2 per instructor.
● Firefighters’ boots BS EN 15090 (2006).
● Heavy socks should be worn under boots.
● Instructors should be clearly identifiable from learners, for example, by using differently coloured protective clothing.

All items of PPE should comply with appropriate standards and display the CE mark.

Fire Authorities may also consider the availability of “cool vests” or other similar clothing in order to reduce fatigue on instructors.

**Breathing Apparatus (BA)**

Breathing apparatus sets should be maintained and tested, to ensure acceptable levels of reliability. Face masks should be cleaned on an ongoing basis.

After each Compartment Fire Behaviour Training course, sets should be closely examined for damage.

**Equipment Testing**

Test times applicable to normal BA use are not applicable to sets which are continually used for Compartment Fire Behaviour Training. Instructors and learners sets should be assigned for Compartment Fire Behaviour Training only. If sets are in continuous use for Compartment Fire Behaviour Training, the normal annual test should be carried out at six-monthly intervals.

If a number of authorities are using a training facility, pooling of breathing apparatus sets and cylinders may be considered, to ensure an adequate number of sets are made available for training and to allow rotation of some sets (for servicing, maintenance, replacement of components).
Section 5 - Learners

Introduction

Learners undertaking Compartment Fire Behaviour Training should be qualified breathing apparatus wearers, and should have completed either a Breathing Apparatus Wearer Course or a Breathing Apparatus Refresher Course within the two-year period preceding Compartment Fire Behaviour Training.

Medical Examinations

Learners should be operationally fit to carry out Compartment Fire Behaviour Training. Medical examinations should be in accordance with the National Occupational Health System (or similar).

Self-Monitoring

After undertaking Compartment Fire Behaviour Training, learners should monitor themselves for unusual symptoms that may be related to their Compartment Fire Behaviour Training activity.

Personal Protective Equipment (PPE)

The PPE provided for learners undertaking Compartment Fire Behaviour Training should be the same as that provided for use at operational incidents. PPE should be in good condition including knee protection.

The following personal protective equipment should be worn by learners:

- Fire fighting tunic BS EN 469 (2005) - tunics should have thumb loops.
- Long sleeves non-synthetic clothing to be worn under the fire fighting tunic.
- Fire fighting leggings BS EN 469, incorporating padded knees.
- Knee pads.
- Fire Helmet BS EN 443.
• Breathing apparatus BS EN 137.
• Water-proof gloves BS EN 659, with thermal lining.
• Anti-Flash hood (shoulder length) BS EN 13911.
• Firefighters’ boots BS EN 15090 (2006).
• Heavy socks should be worn under boots.
• Instructors should be clearly identifiable from learners, for example, by using differently coloured protective clothing.

All items of PPE should comply with appropriate standards and display the CE mark.

**Breathing Apparatus (BA)**

Sets should be used specifically for Compartment Fire Behaviour Training and should be tested and maintained by a competent person.

After each wear, learners should service their sets and record the service in the breathing apparatus log book (after use test).

**Equipment Testing**

Test times applicable to normal BA use are not applicable to sets which are continually used for Compartment Fire Behaviour Training. Instructors and learners sets should be assigned for Compartment Fire Behaviour Training only. If sets are in continuous use for Compartment Fire Behaviour Training, the normal annual test should be carried out at six-monthly intervals.

If a number of authorities are using a training facility, pooling of breathing apparatus sets and cylinders may be considered, to ensure an adequate number of sets are made available for training and to allow rotation of some sets (for servicing, maintenance, replacement of components).
**Section 6 - Training Provision**

**Introduction**

The knowledge gained in the classroom, during practical demonstrations and during practice sessions should generally be applied in carbonaceous CFBT training simulators. Creating the required, safe, simulated environments will help learners to understand how these operational techniques and procedures can be applied.

Examples of exercises which could aid the delivery of this unit are:

- Demonstration of fire development (*Demo*);
- Attack 1 (open door scenario);
- Attack 2 (closed door scenario); and / or
- Window container session / "Cheshire Box".

Combination exercises may also be staged, with a Demonstration burn being continued as an attack exercise, or an attack 1 continued as a backdraught indicating fire exercise, as instructors bring the fire under controlled conditions for each activity.

These exercises provide a learning opportunity, in controlled conditions, for firefighters in fire development. The purpose of the exercises is to provide a fire environment to enable firefighters to develop the ability to:

- recognise burning characteristics, fire behaviour and development within a compartment;
- assess conditions in a compartment and make a decision on whether to undertake firefighting in the compartment; and
- implement control measures and firefighting techniques in a safe and controlled environment.
Types of Container

As indicated above, these exercises are generally carried out using steel containers, designed for the purpose. Three types of container are used:

- **Demonstration container**
  
The purpose of this unit is to be capable of initiating and sustaining a carbonaceous fire, and have the capability to control and release contaminants of fire gases, so as to provide a learning opportunity for firefighters in fire behaviour. The container has a raised section, this controls the development of fire giving learners a visual demonstration of the development of all aspects of the fire’s behaviour, in controlled conditions. Attack exercises and demonstrations may also be staged in a demonstration container.

- **Attack container**
  
The purpose of the container is to provide an experiential facility capable of providing well-ventilated and under-ventilated fire development conditions in a compartment consistent with a practice environment. It provides a fire environment to enable firefighters to develop appropriate firefighting techniques, in a controlled environment.

- **Window Container**
  
The purpose of this unit is to provide a visual demonstration facility capable of producing simulated backdraught conditions in particular pre and post event conditions.

**Fuel loading**

The fuel load in the container should be sufficient to sustain the fire for the required duration (typically the duration of one breathing apparatus cylinder).
Safety

The fire authority providing Compartment Fire Behaviour Training is responsible for implementing the necessary safety and health measures to ensure safe training.

Learners must co-operate with measures put in place to ensure their safety and health, including the wearing of PPE provided for their protection and observing procedures for safety in training.

Container facilities should be provided and maintained so as to ensure risks are identified and controlled. Important considerations include:

- access and egress,
- temperature recording,
- defect recording,
- records of repairs,
- inspection and maintenance,
- change of design – recording.

There should also be a safety check on all equipment to be used in exercises. Instructors should ensure all equipment (including pumps and branches) and water supplies (for training and safety use) are in good working order.

Instructors should ensure the following are available for use:

- a means of communication for ambulance or medical attention, in the event of an accident,
- a first aid kit,
- a burns kit,
- drinking water or suitable drinks,
- Full face masks with P3 filters (for use by personnel while cleaning the container),
- two separate water supplies (appliances).
Learners should be given a safety brief before each exercise. The brief should include:

- a description of the exercise,
- an explanation of the safety measures in place,
- procedures in the case of an accident or emergency,
- escape and exit points,
- duration (time) for the exercise.

Before each exposure or entry to the container, instructors and learners should carry out full buddy checks on personal protective equipment.

All training activities should be supervised by instructors.

Before learners enter the container, the instructor should assess conditions within the container, and learners should enter only when conditions are suitable for the training activity.

Instructors should ensure that Compartment Fire Behaviour Training is not unduly physical for learners and exposure times should not usually exceed one cylinder duration per exercise. Training objectives are achieved by short and controlled periods of exposure to high temperature conditions. During exercises, no learner should be exposed to excessive radiant heat; instructors should rotate learners during the exercise, to avoid accident or injury.

During all wears, instructors should monitor learners for signs of fatigue or disorientation. During debriefs, instructors should monitor learners for signs of discomfort, and make sure that learners are able to re-enter the container, if required.

Any accident should be recorded; records should also include near misses and dangerous occurrences. The fire authority providing Compartment Fire Behaviour Training facilities should be informed by the instructors of any injury that occurs during the training.

The purpose of Compartment Fire Behaviour Training is to provide education, training and guidance - not to unnecessarily expose firefighters or instructors to harmful environments. The expression “warm to inform” should be taken as guidance.
Welfare

Suitable shower, toilet and changing facilities should be available for learners, instructors and pump operators. These facilities should be located within a reasonable distance of the containers. Hot and cold running water should be provided, along with drinking water.

A covered rest area should be available, adjacent to training facilities.

Drying facilities should be available, along with facilities for cleaning PPE and servicing breathing apparatus.

Course timetables should allow for reasonable periods between exercises, without strenuous physical activity.
Introduction

These are generally configured and operated on the model developed in Sweden which burn wood and timber products. This type of system allows the characteristics of a compartment fire to be authentically and consistently reproduced.

This system, using wood as a fuel, is acceptable as a safe and effective training facility, if used in a controlled and risk assessed manner.

The essential characteristics of compartment fire behaviour training involves, the stages of fire development, post initial fire, when the developing event is providing sufficient radiant energy to promote pyrolysis from surrounding materials. In order to replicate this in a significant, realistic and understandable way, it is important to use a fuel type and quantity which responds in a consistent manner when burned in CFBT facilities.

Choice of Fuel

Due to difficulties procuring chipboard and perceived issues in relation to emissions there has been a concerted move nationally and internationally which has seen the fuel used in containers changed from chipboard to orientated strand board (OSB) and/or clean untreated pallets. For the reasons outlined above this guidance endorses this change of fuel type based on individual Fire Authorities carrying out a specific risk assessment in relation to the issue. This should initially involve Fire Authorities examining existing data such as burn time and temperature readings from a series of fires using chipboard as a fuel. Thereafter any change in the type of fuel should be based on trying to replicate the previously established time and temperature data within the temperature constraints defined in this document. This should be achieved using test or control burns where instructors vary conditions to achieve the required conditions. In general it is found that OSB burns with greater intensity than chipboard and has a greater tendency to disintegrate as a fire develops therefore requiring greater restraint e.g. more chains than were previously considered necessary.
Dublin Fire Brigade reported the following fire loadings from the UK in 2006:

**Devon Fire and Rescue Service (OSB Fire Loadings)**

<table>
<thead>
<tr>
<th>Container Type</th>
<th>OSB Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo Container</td>
<td>7’x4, 11mm 6 boards</td>
</tr>
<tr>
<td>Attack Container</td>
<td>7’x4, 11mm 12 boards</td>
</tr>
<tr>
<td>Window Container</td>
<td>7’x4, 11mm 18 boards</td>
</tr>
<tr>
<td>Multi Compartment per fire</td>
<td>7’x4, 11mm 3 boards</td>
</tr>
</tbody>
</table>

**Fire Service College, Morten-in-Marsh (OSB Fire Loading)**

<table>
<thead>
<tr>
<th>Attack Type</th>
<th>OSB Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo</td>
<td>5 x 19mm 8x4 OSB</td>
</tr>
<tr>
<td>Attack 1</td>
<td>8 x 19mm 8x4 OSB</td>
</tr>
<tr>
<td>Attack 2</td>
<td>8 x 19mm 8x4 OSB</td>
</tr>
</tbody>
</table>

Dublin Fire Brigade have indicated (June 2009) that in light of the above and based on a local risk assessment process that they have adopted the following fire loading criteria:

<table>
<thead>
<tr>
<th>Container Type</th>
<th>OSB Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo Container</td>
<td>7’x4, 11mm 6 boards</td>
</tr>
<tr>
<td>Attack 1</td>
<td>7’x4, 11mm 9-10 boards</td>
</tr>
<tr>
<td>Attack 2</td>
<td>7’x4, 11mm 9-10 boards</td>
</tr>
<tr>
<td>Window Container</td>
<td>7’x4, 11mm 18 boards plus 8 non-pressure treated pallets</td>
</tr>
</tbody>
</table>

**Final Extinguishment**

Preparing for an exercise can result in extended turn-round time between each training event within individual units. However, experience has shown that whilst training benefit is achieved by controlling the fire, little additional training benefit is gained by actually extinguishing the fire. In order to make the most effective use of each ‘burn’ for other teams of learners it is usual practice not to allow firefighters to actually extinguish the fire. The practical significance of this procedure should be fully explained to learners.
**Backdraught Simulation**

Wood fuel compartment fire training facilities are capable of producing a real backdraught, the intensity of which will vary considerably dependent upon conditions. When this type of compartment fire training facility is used to deliberately produce a backdraught, it must be done for demonstration purposes only i.e. learners observing the effects of the phenomena only without becoming actively involved.

**Compartment Limits**

Carbonaceous CFBT systems are currently restricted to the teaching of compartment fire behaviour training, utilising a single compartment design.

**Positioning Fuel and Ignition**

All fuel must be placed in appropriate fuel load retainers designed to accommodate the fuel throughout the training event. There is a variety of methods of achieving this which includes the use of chains or rigid frameworks. Whichever system is employed, the burning fuel must maintain its integrity throughout the training activity.

A safe means of igniting the fuel should be used which does not impact upon the overall training fuel load or cause a sudden or rapid fire development.

The loading of fuels must be the subject of a risk assessment, identifying hazards such as dust, sharp edges and manual handling. Where possible, to eliminate manual handling hazards at source, sizes of boards that can be easily handled should be used or failing this, the use of suitable lifting and handling equipment must be considered.
Example of Possible Demonstration Container

A compartment is to be constructed of sheet steel (minimum of 1.3mm) with adequate structural reinforcing. The compartment can be constructed from a standard 2.5 metres x 2.5 metres x 13 metre ISO transport container. The compartment to be raised at one end to provide a raised fire base area configuration, the level to be 0.5 metres above the remaining floor level. The compartment is to be provided with two standard doors, one on each side (2 metre x 1 metre) 1.5 metres from the rear of the compartment. A vent 750-mm x 750-mm is to be provided on the roof of the compartment this to be operable via solid linkage. The compartment is to be provided with a corrugated sloping roof to protect the container and to prevent water ponding affecting fire development within the container. A fire load retainer is to be fitted at the raised end of the compartment. It may be necessary or appropriate to install a means of modifying fire gas movement within a compartment for demonstration purposes. Any such baffle should be of substantial construction, appropriately attached and operable from the interior and exterior of the compartment and comply with design specification requirements. If the baffle may serve a safety critical function it should be designed to fail to the position necessary to achieve this safety requirement.

Example of Possible Attack Container

A compartment is to be constructed of sheet steel (minimum of 1.3-mm) with adequate structural reinforcing. The compartment can be constructed from a standard 2.5 metre x 2.5 metre x 13 metre ISO transport container. The compartment to be provided with one standard door located at the rear of the compartment in a steel bulkhead, across the compartment, a minimum of 1.5 metres from the rear of the compartment. A stable door to be provided on the side of the compartment, 4.8 metres from the rear of the compartment and a standard door located into the lobby created by steel bulkhead at the rear of the container. A vent 750-mm x 750-mm is to be provided on the roof of the compartment; this to be operable via a solid linkage. The compartment is to be provided with a corrugated sloping roof (slope to be approximately 1 metre — 0.5 metres). A fire load retainer is to be fitted at the fire base end of the compartment. It may be necessary or appropriate to install a means of modifying fire gas movement within a compartment for demonstration purposes. Any such baffle should be of substantial construction, appropriately attached and operable from the interior and exterior of the compartment and comply with design specification requirements. If the baffle may serve a safety critical function it should be designed to fail to the position necessary to achieve this safety requirement.

**Section 8 - Exercise: Demonstration of Fire Development (Demo)**

**Introduction**

This exercise relates to learning outcomes (see section 2) in relation to:

- understanding of the principles of combustion and compartment fire behaviour;
- understanding how fire develops and spreads within a compartment; and
- providing an opportunity for instructors to demonstrate the appropriate extinguishing techniques and cooling techniques.

Learners are able to observe the process of pyrolysis, air tract, under-pressure and over-pressure. Learners will in addition experience the effects of radiated heat, lowering of the neutral plane and the effect on visibility. Signs and symptoms of flashover can be identified including the ignition of fire gases (see Learning Outcomes in Section 2).

**Purpose of Container**

The purpose of this compartment is to provide a demonstration and experiential facility capable of producing fire development conditions consistent with a learning environment. The compartment should provide the ability to initiate and sustain a carbonaceous fire, with the capability to control the release or containment of fire gases in a manner which provides a tenable learning environment for personnel for the duration of a fire development event.

**Learner Safety**

Learners, after entering the container, should be located between the raised section of the container and the rear of the container, with learners distributed equally on each side of the container. During the exercise, no learner should be exposed to excessive radiant heat. Instructors should rotate learners during the exercise, to avoid accidents or injuries. Learners should be advised to bring safety concerns or injury to the attention of an instructor.
Instructors

The following is a possible distribution of tasks for instructors:

- Instructor A under air in BA, positioned in line with the chimney vent, between the students and the fire, provides a commentary to learners in relation to fire development.

- Instructor B under air, positioned in line with the chimney vent, between the students and the fire, on the opposite side of the container from Instructor A with a charged hose-reel to control the fire if required.

- The students are equally dispersed to each side of the container, between Instructors A and B and the main exit from the container.

- Instructor C, in a position outside the container, operating the baffle as required.

- Instructor D under air, positioned externally to the rear of the container in visual contact with the other instructors and the pump operator. Instructor D is positioned with a charged 45-mm safety line and is responsible for overall safety during the exercise.

Instructors can alternate positions and roles during the exercise, to avoid excessive heat.
Hose lines

All branches should be tested outside the container before commencing the exercise.

The arrangement of hoses and their use reinforces the operational requirement and use of a back-up 45-mm line.

Diagram 1

Legend:
- Instructor (A-D)
- Learner
- Hosereel (black)
- 45-mm (red)
**Section 9 - Exercise: Attack 1**

**Introduction**

This exercise relates to learning outcomes (see section 2) in relation to:

- Understand how fire develops and spreads within a compartment and how it can be extinguished;
- Understand and demonstrate the appropriate extinguishing techniques and cooling techniques; and
- Demonstrate the appropriate entry techniques, recognise the hazards and risks within the environment, and apply the appropriate tactics.

The exercise provides an opportunity for learners operating in teams of two to apply the techniques necessary to control conditions within the compartment. The exercise provides an opportunity to practice external door entry techniques, to control conditions within the compartment prior to entry and to practice gas cooling within the compartment (see Learning Outcomes in Section 2).

**Purpose of the Container**

The purpose of the container is to provide an experiential facility capable of providing well-ventilated (and under-ventilated) fire development conditions in a compartment consistent with a practice environment. The compartment should provide the ability to initiate and sustain a carbonaceous fire, with the capability to control the release or containment of fire gases in a manner which provides a controlled fire environment to be developed, enabling safe access to and from the fire compartment enabling practical application of fire fighting techniques to be utilised.

**Duration**

Maximum duration of wear: One cylinder duration

During this exercise, the instructors should control the conditions to avoid excessive heat build up and should constantly monitor the temperatures to achieve ideal conditions.
Learner Safety

Learners should operate in teams of two during this exercise. There should be no more than two learners in the container at a time.

Teams should cool gases on the instructors’ instructions, and continue to cool gases while making their way out of the container, (all the while working from a kneeling position and facing the fire).

Learners should be restricted from advancing beyond the location of the side stable door. Instructors should rotate learners during the exercise, to avoid accidents or injuries. Learners should be advised to bring safety concerns or injury to the attention of an instructor.

Instructors

The following is a possible distribution of tasks for instructors:

- Instructor A should be in position beside the learner team leader at all times during the exercise, including entry and exit from the container. Instructor A should ensure that learners do not proceed beyond the side stable door when participating in the exercise.

- Instructor B is positioned at the side door to the container with a hose-reel monitoring the safety of the team inside the container and ready to enter and control the fire should the need arise.

- Instructor C is in position to control conditions using the chimney vent as required while monitoring the temperature inside the container.

- Instructor D should have an overview of the exercise and the other instructors, in position at the rear door of the container, will be responsible for overall safety during the exercise having available a 45-mm safety hose line for this purpose.

- Instructor D should co-ordinate teams waiting to enter the container and debrief teams in conjunction with Instructor A after they exit the container.

Instructors may rotate positions and roles during the exercise, to avoid excessive heat.
Hose lines

All branches should be tested outside the container before commencing the exercise.

The arrangement of hoses and their use reinforces the operational requirement and use of a back-up 45-mm line.

Diagram 2

Legend:

- **Instructor (A-D)**
- **Student**
- **Hosereel (black)**
- **45-mm (red)**
Section 10 - Exercise: Attack 2

Introduction

This exercise relates to learning outcomes (see section 2) in relation to learners’:

- understanding how fire develops and spreads within a compartment and how it can be extinguished;
- demonstrating the appropriate extinguishing techniques, cooling techniques and ventilation techniques; and
- demonstrating the appropriate entry techniques, recognise the hazards and risks within the environment, and apply the appropriate tactics.

Backdraught suppression techniques may be taught and practiced but activity specific risk assessments should be carried out to ensure that the conditions do not create a backdraught.

Purpose of Container

The purpose of this exercise is to provide an experiential facility capable of providing conditions similar to under-ventilated fire development conditions in a compartment consistent with a practice environment. The compartment should provide the ability to initiate and sustain a carbonaceous fire, with the capability to control the release or containment of fire gases in a manner which provides a controlled fire environment to be developed, enabling safe access to and from the fire compartment enabling practical application of fire fighting techniques to be utilised.

Duration

Maximum duration of wear: One cylinder duration

During this exercise, the instructors should control the conditions to avoid excessive heat or fire gas build up and should constantly monitor the temperatures to achieve appropriate conditions.
Learner Safety

Learners should operate in teams of two during this exercise. There should be no more than two learners in the container at a time. Team will carry out door entry procedures, cool gases, and exit from the container – at all times under supervision of instructor A.

Instructors

The following is a possible distribution of tasks for instructors:

- Instructor A should be in position beside the learner team leader at all times during the exercise, including entry and exit from the container. Instructor A should ensure that learners do not proceed beyond the side stable door when participating in the exercise.

- Instructor B is positioned at the side stable door to the container with a hosereel monitoring the safety of the team inside the container and ready to enter and control the fire should the need arise.

- Instructor C is in position to control conditions using the chimney vent as required while monitoring the temperature inside the container. Instructor C will indicate to Instructor D when conditions are suitable and safe for learners to enter the container.

- Instructor D should have an overview of the exercise and the other instructors, in position at the door through which the learners enter the container, will be responsible for overall safety during the exercise having available a 45-mm safety hose line for this purpose. Instructor D should:
  - Co-ordinate teams outside the container;
  - Monitor door entry procedures of teams entering and exiting the container; and
  - Monitor health and safety of teams and instructors entering and exiting the container.
• Instructor D should record the performance of teams in relation to door entry procedures; this information can be used as part of the debriefing of the team. It can be helpful for instructors to be able to identify learner teams; different coloured cylinder covers can be used for this purpose.

• Instructors may rotate positions and roles during the exercise, to avoid excessive heat.

**Hose Lines**

All branches should be tested outside the container before commencing the exercise.

The arrangement of hoses and their use reinforces the operational requirement and use of a back-up 45-mm line.

**Exercise Sequence**

Each learner team, accompanied by an instructor, should:

• Perform door entry procedures at the side door, assess conditions within the container, and assess whether entry to the container is safe;

• Perform door entry procedures at the internal door, and assess conditions within the fire compartment;

• Decide whether to undertake firefighting in the compartment, or to control conditions from outside the compartment; and

• If safe, enter and control the fire in the compartment.
Diagram 3

Legend:
- Instructor (A-D)
- Learner
- Hosereel (black)
- 45-mm (red)

45-mm safety line available to Instructor D

Rear doors open, side doors closed
Section 11 - Exercise: Window Container

Introduction

This exercise relates to learning outcomes in relation to:

- understanding the principles of combustion and compartment fire behaviour;
- understanding how fire develops and spreads within a compartment and observing a demonstration of how it can be extinguished;
- understanding and observing a demonstration of the appropriate extinguishing techniques, cooling techniques and ventilation techniques; and
- understanding the hazards and risks within the environment, and applying the appropriate tactics and observing a demonstration of the appropriate entry techniques.

In particular it offers an opportunity for learners to observe the techniques necessary to mitigate backdraught conditions.

The training compartment used for this exercise is a visual demonstration facility capable of producing backdraught and flashover conditions in particular pre and post event conditions.

Learner involvement in this exercise is limited to observation and therefore where time or environmental restrictions exist a video of the unit in operation may suffice.

Example of Possible Container

A compartment is to be constructed of sheet steel (minimum of 1.3-mm) with adequate structural reinforcing. The compartment can be constructed from a standard 2.5 metre x 2.5 metre x 6.5 metre ISO transport container. Compartment to be provided with two stable type doors (2 metres x 1 metre) and hinged window (1 metre x 1 metre) all to be constructed from steel plate with locking handles. The doors are to be located at side and rear of compartment. The rear door to be fitted into a purpose made wall across the width of the compartment. The compartment is to be fitted with a sloping corrugated roof (slope to be 1 metre — 0.5 metres). A fire load retainer is to be fitted at one end of the compartment. The compartment can be fitted with a steel floor.

**Diagram 4**
Section 12 - Records

Introduction

Records should be maintained for exercises carried out during Compartment Fire Behaviour Training Courses. The attached forms provide a suggested format for recording information:

- Form CFBT1 can be used to record the exposure of instructors to high temperature conditions during a Compartment Fire Behaviour Training course. One form should be completed in respect of each instructor.

- Form CFBT2 can be used to record the exposure of learners to high temperature conditions during a Compartment Fire Behaviour Training Course. One form may be used for all learners on the course.

- Student Assessment Sheet (Attack 1).

- Student Assessment Sheet (Attack 2).

All records should be retained by the organisation providing the Compartment Fire Behaviour Training.
FORM CFBT 1
COMPARTMENT FIRE BEHAVIOUR TRAINING COURSE

RECORD OF INSTRUCTOR’S EXPOSURE

Name of Instructor: ________________________________________________

Course duration: from _________________________ to ___________________________

Course location: _____________________________________________________________

<table>
<thead>
<tr>
<th>DATE OF WEAR</th>
<th>Type: (Demo/Atk 1/Atk 2)</th>
<th>HIGHEST INTERNAL CONTAINER TEMPERATURE RECORDED DURING EXERCISE (°C)</th>
<th>Ear Temp Start</th>
<th>Ear Temp End</th>
<th>DURATION OF EXPOSURE (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMMENTS:

Signed: _________________________________________  Date: ______________________
FORM CFBT 2
COMPARTMENT FIRE BEHAVIOUR TRAINING COURSE

RECORD OF LEARNERS’ EXPOSURE

Course duration: from _________________________ to ___________________________

Course location: _____________________________________________________________

<table>
<thead>
<tr>
<th>Learner</th>
<th>Date</th>
<th>Exercise</th>
<th>Maximum temp. (°C)</th>
<th>Duration of exercise (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>Demo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>Attack 1 Flashover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>Attack 2 Backdraught indicating fire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Injuries or accidents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Print name</th>
<th>Signed</th>
<th>Date</th>
<th>Pump operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Assessment Sheet - CFBT

### Attack 1

**Student Name:** ______________________________________________________________

**Instructor Signature:** _________________________________________________________

**Instructor Name:** ___________________________________________________________

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Successful</th>
<th>Referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Check branch and adjust setting if necessary before approaching container</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Perform Dynamic Risk Assessment - Recognise hazards and risks; consider conditions and decide whether to enter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Demonstrate external door entry technique.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Demonstrate gas cooling using spray.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Demonstrate how to advance as a team within the risk area - apply appropriate tactics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Demonstrate how to withdraw as a team within the risk area - apply appropriate tactics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Manage hose within the risk area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Communicate effectively with team members and provide an accurate and concise appraisal of tasks performed and prevailing conditions to ECO on exit.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Insert details of any competence graded as “referred”, exceptional performance or any noteworthy incident in the space overleaf:

**Course Director Signature:** __________________________________________________

**Course Director Name:** _______________________________________________________
Assessment Sheet - CFBT

Attack 2

Student Name: ________________________________________________________________

Instructor Signature: __________________________________________________________

Instructor Name: ______________________________________________________________

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Successful</th>
<th>Referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Perform Dynamic Risk Assessment - Recognise hazards and risks; consider conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and decide whether to enter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Demonstrate external door entry technique.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Demonstrate temperature check.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Demonstrate cooling of compartment adjacent to the fire room before entry.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Perform Dynamic Risk Assessment - Recognise hazards and risks; consider conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and decide whether to enter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Demonstrate internal door entry technique.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Demonstrate gas cooling using spray.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Demonstrate how to advance as a team within the risk area - apply appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tactics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Demonstrate how to withdraw as a team within the risk area - apply appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tactics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Manage hose within the risk area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Communicate effectively with team members and provide an accurate and concise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>appraisal of tasks performed and prevailing conditions to ECO on exit.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Insert details of any competence graded as “referred”, exceptional performance or any noteworthy incident in the space overleaf:

Course Director Signature: _____________________________________________________

Course Director Name: _________________________________________________________
Section 13 - Ancillary Documentation

Introduction

Fire Authorities are required to create and maintain a course file in relation to periods of instruction such as a Compartment Fire Behaviour Training course. This will include generic documentation applicable to all training which is not included in this guidance e.g. nomination forms, medical records, accident reports, attendance records, pre and post course meetings etc.

Documentation specific to Breathing Apparatus training is included in this section of the guidance and includes:

- Individual Candidate Marking Sheet

  This document consolidates the marks obtained by a learner during training.

- FETAC Module Results Summary Sheet.

  This document consolidates the overall marks obtained by a group of learners undergoing the same module of instruction.

- Record of Learner Interview

  Learners will generally attend an interview at a minimum once in each week. The details of these interviews (and any others) should be recorded.
Candidate Name: ____________________________________   PPSN: _________________

Training Centre: _____________________________________ Centre No.: ______________

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Maximum Mark</th>
<th>Candidate Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simulated Exercises “Wears”</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate the appropriate extinguishing techniques,</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>cooling techniques and ventilation techniques.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate the appropriate entry techniques, recognise</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>the hazards and risks within the environment, and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>apply the appropriate tactics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>80</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Written Exam / Interview</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain the principles of combustion and compartment</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>fire behaviour.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain how fire develops and spreads within a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>compartment and how it can be extinguished.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>20</strong></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL MARKS</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

**GRADE**

*Internal Assessor’s Signature:* _________________________________________________

*Date:* ______________________________________
**Guidance on Assessment**

**Guidance on Completion of Assessment Sheets**
1. Assessment sheets are designed to offer instructors a simple and efficient method of recording the assessment of learners. Each activity should have a separate set of assessment sheets. The assessment sheets contain a table indicating the key criteria to be assessed in the particular exercise. If a learner has not achieved the required standard in a particular competence “Referred” should be indicated against the relevant row. A brief description of the actions of the learner’s performance should be included and any other noteworthy details.

**General Observations for Fire Authorities and Instructors**
2. The terminology applied in relation to assessment sheets is “successful” / “referred”. The term “referred” relates to learner performance that does not meet the requirements outlined in the learning outcomes and is “referred” back to the learner. For example a learner may perform to a reasonable standard during a wear but may not reach the required standard in a particular assessment criteria due to an omission or oversight e.g. poor hose management by one or both of the team. During Attack 1 wears this is to be expected and is to be considered a valuable part of the learners learning activity. How the learner reacts to the “referred” issue, inside the risk area and during the debriefing, is of importance. How quickly the learner realises their mistake inside the risk area is also important as is how the learner attempts to rectify the issue. It is essential that the
instructor would insert a brief description of the incident outlining an opinion on the severity of the omission by the learner. The “hot debrief”, and if necessary a short one-to-one session with an instructor thereafter, should ensure that the learner is fully aware of the issue and its seriousness. The learner should be provided with advice, and if necessary a practical session, to indicate how to prevent a reoccurrence of the issue (this activity should be recorded in the course file). At the next opportunity when the learner is afforded a chance to demonstrate competence in the specified area it is important that monitoring takes place to ensure a pattern does not develop. Rotating the instructors performing the assessment activity can add valuable insights and ensure fairness in the assessment process.

Where a learner is unsuccessful, on a first attempt in an assessment activity, it is good practice for providers to provide learners with an opportunity to repeat the assessment activity to achieve a pass grade. Opportunities to repeat an assessment activity are dependant on the nature of the activity and the practical and / or operational issues involved
Source: FETAC

Unsuccessful in Achieving Competence
3. Assessing whether a learner does or does not achieve competence is a major issue for both instructors and learners. Fire Service training, Instructional staff should not hesitate to grade a learner as “Unsuccessful / Referred” for the overall module if a learner has not demonstrated competence in the specified areas. A learner who feels they have been wrongly graded as “Unsuccessful / Referred” can appeal the decision through the FETAC system and may be offered an opportunity to repeat the training. Well maintained course documentation including assessment sheets must be used as justification for grading a learner as “Unsuccessful / Referred”.

4. Mistakes, oversights and misunderstandings and the associated remedial process are to be considered a valuable part of any learning activity.
5. However a pattern of repeated “referred” grades for a particular competence(s) must be carefully considered in light of the life safety implications. Instructional staff as a group will make the decision to grade a learner as “Unsuccessful / Referred”. This should eliminate any personal bias that could exist.

6. Ultimately where the performance of a learner has indicated a reasonable possibility that the learner could be a danger to themselves, their colleagues or the public through a lack of competence then an “Unsuccessful / Referred” grade for the module is the only course of action open to the instructional staff. This principle over-rides any assessment of marks achieved during training. While a learner may accumulate marks over the course of instruction; no learner can be certified as having “passed” if a life safety issue exists in relation to an area(s) of competence.

Remedial Action

7. It is the responsibility of instructional staff and learners to identify areas where learners (individual and/or group) are experiencing difficulties and to implement remedial action in order to rectify the situation. This may entail amending the course programme in order to facilitate additional sessions on particular skill areas or offering tuition outside of normal course programme times. All such actions should be clearly recorded in the course file.
Module Results Summary Sheet

Module Title: Compartment Fire Behaviour Training (Initial)

Dates of Training: ___________________________________________________________

Module Code: TBA

<table>
<thead>
<tr>
<th>Candidate Details</th>
<th>Total Percentage (100%)</th>
<th>Grade *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidate Surname</td>
<td>Candidate Forename</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Signed: ____________________________________________________________________

Internal Assessor: _________________________________  Date:______________________

This sheet is for internal assessors to record the overall marks of individual candidates. It should be retained in the training centre. The marks awarded should be transferred to the official FETAC Module Results Sheet issued to centres before the visit of the external Authenticator.

Grade*
D: 80 - 100%  Distinction
M: 65 - 79%  Merit
P: 50 - 64%  Pass
U: 0 - 49%  Unsuccessful / Referred
W: candidates entered who did not present for assessment
Record of Learner Interview

Compartment Fire Behaviour Training

Fire Authority: ______________________________________________________________

Location: ___________________________________________________________________

Course Dates: _______________________________________________________________

Learner Name: ______________________________________________________________

Date and Time of Interview: ___________________________________________________

<table>
<thead>
<tr>
<th>Attendance at Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Content</th>
<th>Additional Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Highlight examples of areas where the learner is performing in a satisfactory manner:</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Content</td>
<td>Additional Remarks</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>--------------------</td>
</tr>
<tr>
<td>2.</td>
<td>List (if applicable) any areas where the learner is not achieving the required standard and indicate remedial action proposed:</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>List (if applicable) any areas where the learner should focus efforts to improve overall performance:</td>
<td></td>
</tr>
</tbody>
</table>
| 3.   | Assessment of performance to date:  

*Satisfactory* / *Unsatisfactory*  
Delete as appropriate |                     |
The following list is provided to assist instructors when preparing for learner interviews and completing the sections above:

**General Competencies**

- Taking initiative;
- Taking responsibility for one’s own learning and progress;
- Problem solving;
- Applying theoretical knowledge in practical contexts;
- Communicating orally;
- Working effectively in group situations;
- Understanding health & safety issues including Dynamic Risk Assessment; and
- Reflecting on and evaluating quality of own learning and achievement.

**BA / CFBT Competencies**

- Work in toxic, oxygen deficient and irrespirable atmospheres;
- Wear self contained breathing apparatus;
- Assemble and maintain appropriate breathing apparatus sets;
- Operate and comply with specific control procedures;
- Operate effectively as part of a team;
- Demonstrate the appropriate extinguishing techniques, cooling techniques and ventilation techniques.
- Demonstrate the appropriate entry techniques, recognise the hazards and risks within the environment, and apply the appropriate tactics.

Instructor Signature: __________________________________________________________

Learner Signature: __________________________________________________________
“Runners and Riders”

Wear Number: _______________________________   Date: ____________________________

<table>
<thead>
<tr>
<th>Team</th>
<th>Team Member</th>
<th>Name</th>
<th>Appointment</th>
<th>Details If applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1</td>
<td></td>
<td>Team Leader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Entry Control Officer _______________________________________

Pump Operator ________________________________________________

Instructor Name and Role _____________________________________

Instructor Name and Role _____________________________________

Instructor Name and Role _____________________________________

Instructor Name and Role _____________________________________

Instructor Name and Role _____________________________________
Sample Examination Sheet

Compartment Fire Behaviour Training

Written or Oral Exam ________________________________________________________________

Student Name: ____________________________________________________________________

Instructor Signature and name: ______________________________________________________

Instructions: Answer all questions, time allowed 60 minutes

<table>
<thead>
<tr>
<th>Assessment Criteria</th>
<th>Mark (to be completed by instructor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Combustion (20 marks in total)</td>
<td></td>
</tr>
<tr>
<td>Draw and label the sides of the triangle of fire (6 marks available)</td>
<td></td>
</tr>
<tr>
<td>Assessment Criteria</td>
<td>Mark (to be completed by instructor)</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>List the 3 methods of extinguishing a fire (3 marks available)</td>
<td></td>
</tr>
<tr>
<td>List the 3 methods that heat transmission occurs (3 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain pyrolysis (5 marks available)</td>
<td></td>
</tr>
<tr>
<td>List the 3 main products of combustion (3 marks available)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Fire behaviour (20 marks in total)</strong>&lt;br&gt;Explain limits of flammability&lt;br&gt;(5 marks available)</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Explain flash point&lt;br&gt;(5 marks available)</td>
</tr>
<tr>
<td></td>
<td>Explain fire point&lt;br&gt;(5 marks available)</td>
</tr>
<tr>
<td></td>
<td>List 3 sources of Ignition;&lt;br&gt;(3 marks available)</td>
</tr>
<tr>
<td></td>
<td>List 2 types of flame&lt;br&gt;(2 marks available)</td>
</tr>
</tbody>
</table>
### Assessment Criteria

<table>
<thead>
<tr>
<th>3</th>
<th><strong>Diagrams (20 marks in total)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indicate the following terms in the a diagram representing a compartment: air tract, under pressure, over pressure, neutral plane; (10 marks available)</td>
</tr>
<tr>
<td></td>
<td><img src="image1.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td>Indicate the stages of development (growth, flashover, fully developed, decay); on the following graph: (10 marks available)</td>
</tr>
<tr>
<td></td>
<td><img src="image2.png" alt="Graph" /></td>
</tr>
<tr>
<td>Assessment Criteria</td>
<td>Mark (to be completed by instructor)</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>4 Fire development (20 marks in total)</td>
<td></td>
</tr>
<tr>
<td>Describe a smouldering fire</td>
<td></td>
</tr>
<tr>
<td>(7 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain the term backdraught</td>
<td></td>
</tr>
<tr>
<td>(7 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain the term fire-gas ignition</td>
<td></td>
</tr>
<tr>
<td>(6 marks available)</td>
<td></td>
</tr>
<tr>
<td>Assessment Criteria</td>
<td>Mark (to be completed by instructor)</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>5  Compartment fire spread (20 marks in total)</td>
<td></td>
</tr>
<tr>
<td>List 4 factors affecting flame spread (initial fire)</td>
<td></td>
</tr>
<tr>
<td>(4 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain the effects of insufficient fuel on a fire</td>
<td></td>
</tr>
<tr>
<td>(4 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain the effects of limited ventilation;</td>
<td></td>
</tr>
<tr>
<td>(4 marks available)</td>
<td></td>
</tr>
<tr>
<td>List 4 factors affecting fire growth:</td>
<td></td>
</tr>
<tr>
<td>(4 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain how fire can spread to adjacent compartments;</td>
<td></td>
</tr>
<tr>
<td>(4 marks available)</td>
<td></td>
</tr>
<tr>
<td>Assessment Criteria</td>
<td>Mark (to be completed by instructor)</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>6  <strong>Extinguishing theory / methods (20 marks)</strong></td>
<td></td>
</tr>
<tr>
<td>Explain the use of water in a compartment fire (effects of steam); (6 marks available)</td>
<td></td>
</tr>
<tr>
<td>Describe 3 extinguishing techniques; (3 marks available)</td>
<td></td>
</tr>
<tr>
<td>Dynamic Risk Assessment (temperature checks); (5 marks available)</td>
<td></td>
</tr>
<tr>
<td>Explain an initial tactical deployment, hose types and locations; (5 marks available)</td>
<td></td>
</tr>
<tr>
<td>Define a compartment (6 marks available)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>Assessment Criteria</strong></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------</td>
</tr>
<tr>
<td>7</td>
<td><strong>Signs and Symptoms (20 marks)</strong></td>
</tr>
<tr>
<td></td>
<td>List the external signs and symptoms of possible backdraught</td>
</tr>
<tr>
<td></td>
<td>List the internal signs and symptoms of possible backdraught</td>
</tr>
<tr>
<td></td>
<td>List signs and symptoms of flashover</td>
</tr>
</tbody>
</table>
TOTAL MARKS FOR EXAMINATION OUT OF 140 (A)

PERCENTAGE MARKS (B)
Total Marks (A) multiplied by 100 and divided by 140

GRADE
Pass 50 - 64%
Merit 65 - 79%
Distinction 80 - 100%

CONTRIBUTION TO OVERALL MODULE RESULT (C)
Percentage Marks (C) multiplied by overall marks allocated to the examination i.e. 20

Example: Learner achieves the following scores in questions 1 – 7:

10, 12, 14, 12, 8, 10, 15

(A) = 81

(B) = 58% - Grade PASS

(C) = 11.6 marks (can be rounded up to 12)

It should be explained to learners in advance of the examination that to “pass” the overall module they must “pass” the examination i.e. achieve a minimum of 50%.

Learners should be informed in advance whether or not they will be provided with an opportunity to re-sit the examination should they be unsuccessful in achieving a pass grade at the first attempt.

Learners who do not achieve the pass grade i.e. 50% should be provided with an opportunity to discuss and explain their performance with an instructor.
References

Fire Service Manual Volume 4 – Fire Service Training

The Use of Breathing Apparatus in the Fire Service
Department of the Environment, Heritage and Local Government (2007)

Fire Service Manual Volume 2 – Fire Service Operations
*Compartment Fires and Tactical Ventilation*
published by HM Fire Service Inspectorate, Publications Section (1997)

Fire Service Ancillary Safety Statement (and associated Generic Risk Assessments)
Department of the Environment, Heritage and Local Government (2007)

National Incident Command System
Department of the Environment, Heritage and Local Government (2007)

UK Fire and Rescue Service Circular 18/2009
Firefighter Safety at Operational Incidents
Communities and Local Government (2009)

UK Fire and Rescue Service Circular 55/2004
The Building Disaster Assessment Group - Key Research Findings
Communities and Local Government (2004)
Standard Operational Guidance (SOGs)  
Published (from March 2010) by the National Directorate and adopted locally by Fire Authorities


Safety, Health, and Welfare at Work (Confined Spaces) Regulations 2001

Safety, Health, and Welfare at Work (Construction) Regulations 2006