Communities and Local Government

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CHIEF FIRE & RESCUE ADVISER

Fire and Rescue Service Operational Guidance

GRAs
generic risk assessments

GRA 3.1
Fighting fires in buildings

Generic Risk Assessment 3.1

Fighting Fires in Buildings

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SECTION 1

GRA 3.1 Fighting fires in buildings

Scope

This Generic Risk Assessment examines the hazards, risks and control measures relating to Fire and Rescue Service personnel, the personnel of other agencies and members of the public when Service personnel are fighting fires in buildings.

It assesses the issues which may be present from the building structure itself, to the contents and the tasks undertaken by firefighting crews.

Depending on the nature and scale of the operational incident, a variety of significant hazards may be present. A Fire and Rescue Service may therefore need to consider the contents of other specific generic risk assessments in this series.

You should therefore consider this generic risk assessment in conjunction with all other relevant assessment, which may include:

- 2.3 Rescues from lifts and escalators
- 3.2 Fighting fires in high rise buildings
- 3.3 Fighting fires in chimneys
- 3.6 Fighting fires using positive pressure ventilation
- 3.8 Fighting fires in public entertainment venues
- 3.9 Fighting fires in secure accommodation
- 5.1 Electricity
- 5.8 Flashover, backdraught and fire gas ignitions
- 5.9 Asbestos

Fire and Rescue Services must conduct their own assessments and produce their own safe systems of work (which include Standard Operating Procedures (SOP's), training programmes, provision of equipment, levels of response etc) within the context of integrated risk management plans, local conditions, knowledge and existing organisational arrangements.

Significant hazards and risks

There are four key areas that have the potential to cause harm during firefighting in buildings:

- construction and design

- the contents and use of the building
- the nature of the fire and operational tasks
- working and environmental conditions.

The risk to personnel will vary dependant upon the tasks being undertaken and the resources provided.

Construction and design

BUILDINGS OF COMPLEX DESIGN OR CONSTRUCTION

Consideration should be given to the hazards presented by unusual and innovative buildings e.g. buildings with vertical shafts, extensive ducting, extensive atria or buildings that have had widespread modifications. Hazards may include:

- type/methods or construction (traditional/modern etc)
- construction materials
- difficulty in locating the fire
- complex internal and external access/egress arrangements
- change of use or alterations, compliance with building regulations
- types of active and passive fire safety systems.

Listed below are some of the significant hazards associated with buildings involved in fire.

LARGE STEEL FRAMED OPEN PLAN BUILDINGS

These buildings, often built in retail or industrial parks, comprise of a large open plan, single storey structures without fixed fire protection systems. Current legislation allows for extremely large developments provided that adequate exits are incorporated in the sidewall. Hazards may include:

- difficulty in locating fire
- rapid generation and travel of the products of combustion
- excessive temperatures
- structural collapse in the early stages of the fire
- no control over the nature of goods or storage systems which can effect the rate of fire development and spread
- likelihood of fire spread to other buildings or structures due to higher level of radiated heat
- collapsing of racking/shelving.

LARGE INSULATED SANDWICH PANELS

The safety of firefighters in buildings containing sandwich panels is a concern although building occupants may also be at risk. Other factors are the possibility of large property losses and environmental pollution.

What are large insulated sandwich panels?

Sandwich panels take many forms but concern is centered around those with metal skins, and with “fillings” made of one of the following materials:

- expanded polystyrene
- polyurethane
- mineral fibre (also known as mineral wool).

As the filling material may be combustible there is a potential fire safety problem which needs to be considered. The panels are usually between 50mm and 200mm thick.

Where are large insulated sandwich panels used?

Large insulated sandwich panels have been used for many years for the external envelope of buildings and are rarely involved in fire. The panels have also been widely used in cold stores where reliable temperature control is achieved with the polymer-filled types.

However, large insulated sandwich panels have also been used as internal partitions or linings, in particular by the food processing industry. The use of the panels has also been reported in hospitals and retail premises.

Fires that involved sandwich panels produced large quantities of black smoke. In many cases firefighters needed to use breathing apparatus while working around the outside perimeter of the building.

In addition, there may be ammonia released from damaged refrigeration plant. There are also a number of pollution risks from fires involving sandwich panels.

For fire fighting there are evident risks. The fuel in the panels will contribute to the fire development, and the fire can spread quickly and unseen, both within the panels and within the voids behind and above the panels. As there is no fire resistance requirement for the fixings of these panels this can lead to sudden delamination or collapse of the panels. In addition, the nature of the panels themselves, which are intended to provide a watertight surface for hygiene purposes, makes it extremely difficult for firefighters to get fire fighting water onto such fires.

There is some difficulty in identifying the different types of panel once they are in place and the core hidden. It would be useful to the fire service, and to building owners, if there were some means of identifying the different types of panel once they were in place, for instance by labeling.

RAPID FIRE SPREAD IN UNPROTECTED VOIDS

Regulatory requirements ensure the possibility of rapid fire spread through unprotected voids is kept to a minimum. However, unscrupulous workmanship or the presence of older building stock constructed before modern legislative control may result in fire spread through such voids. This is exemplified in the following example.

Many schools built in the 1960's were constructed under the Construction for Local Authorities Schools Programme. This type of construction has resulted in difficult incidents being attended in the past, with undetected, rapid spread of fire in unprotected voids. This is due to the internal walls of the building only reaching the suspended ceiling and no separation between rooms above the false ceiling.

Fire can also weaken the fixing holding the panels and there is an increased risk of panels planning onto personnel/public below.

Rapid fire spread of fire is a significant risk in modern timber framed buildings. Experience has shown that in some cases, modern methods of construction built over old building stock may create voids and result in rapid fire spread.

FIXED INSTALLATIONS

Various types of fixed installations may be found in buildings, dependant on the content and processes operated in the building. These may vary from a simple sprinkler system to dry powder or inert gas systems. In the case of the former, firefighters operating in the area will become saturated and caution should be exercised when re-deploying personnel with damp personal protective equipment due to the possibility of steam burns. For dry powder or inert gases, an irrespirable atmosphere will be present.

Fixed installations should not be relied upon to operate effectively on all occasions, as they may have been subject to inappropriate maintenance or vandalism.

DOMESTIC PROPERTY

Fires in domestic properties are a core function of the Fire and Rescue Service's activity. Once constructed there is no regulatory requirement placed on owners of domestic properties to maintain fire prevention and protection measures.

Over the life of a building, various modifications (e.g. extensions, installations of sockets, or other do-it-yourself activities) may perforate the structure and compromise the fire integrity of the building.

Hazards encountered in domestic properties include:

- potentially high fire loading from video tapes, CD's, DVD's etc. associated with TV and computer equipment potentially increasing the risk of backdraught and flashover
- high temperatures encountered in fire situation due to modern insulation methods
- deliberately placed '*booby traps*', usually in areas of social deprivation.

Fire development assisted by overhead canopies situated over the front doors of domestic properties, should be considered as a possible hazard to firefighters.

Research undertaken following a serious injury to a firefighter, has indicated that a relatively small fire outside a house below such a canopy has the potential to rapidly build up heat as the canopy may act as a 'radiating panel'. In the incident, referred to above, a small fire in a wheelie bin quickly developed spreading through a meter access area

opening beneath the canopy and allowed the fire to accelerate up a staircase and into a bedroom where a firefighter was carrying out a rescue. Although the materials of the walls and combustible materials beneath the canopy assisted in the fire development, the part played by the canopy has proven to be a hazard worthy of consideration. A relatively small fire in such areas should not be underestimated.

ASBESTOS

It is virtually impossible to compile a definitive list of premises containing asbestos. However, it is prudent to assume that all buildings constructed or altered during the 1950's to the mid 1980's may contain asbestos to some extent.

NOTE:
All asbestos containing materials were banned in 1999). (Further details can be found in GRA 5.9 – '*Incidents involving asbestos containing materials*)

UTILITIES

The following utilities present hazards which should be considered:

- If a building is damaged by fire it is probable that the electrical system will have been affected. In addition, escaping gas (both natural and liquefied petroleum gas) from fractured pipework and damaged gas appliances may present an explosion risk
- Large complexes may have significant high voltage apparatus including transformers and their own sub-stations
- Pressurised gases (e.g. oxygen, nitrous oxide, entinox, liquefied petroleum gas and acetylene) may be found in premises such as hospitals or workshops
- Some buildings, particularly hospitals, have steam lines. These are sometimes superheated and if released would pose a significant hazard to firefighters
- Water/sewage pipes may also be damaged as a result of fire due to modern plastic construction.

Overhead hazards such as hanging wires, overhead cabling etc, can become affected by heat and fire conditions and may impede safe access either by becoming a trip hazard, entanglement hazard or as a risk of electrocution.

DERELICT BUILDINGS/DANGEROUS STRUCTURES

Derelict buildings can be defined as abandoned buildings usually in a state of disrepair, or under demolition. The local building authority may also have identified these types of buildings as being "dangerous structures".

Although unoccupied by owners or tenants, homeless people may be in residence.

Hazards may include:

- increased risk of structural collapse

- difficult external and internal access/egress (e.g. shuttered windows and doors, security fencing etc)`
- exposed services
- unsafe floors and staircases
- the presence of asbestos
- the presence of other hazardous substances (e.g. chemical, biological hazards etc).

The contents and use of the building

- fire load and its distribution
- type of occupancy
- conflicts between single/multiple owners/occupiers
- current legislation
- known deficiencies in fire protection
- correct design for the use and occupancy of the building
- safety management
- housekeeping.

LACK OF SAFETY CRITICAL INFORMATION

Accident investigations and Health and Safety Executive inspections have identified the gathering and promulgating of safety critical information (7(2)d) as a weakness.

Firefighters are provided with some information and training regarding various types of construction, however, this has proved insufficient and should be considered a significant risk for all Fire and Rescue Services. Sandwich panels, for example, may be easily recognised as part of the external structure, but may have been used internally and not be as apparent. Similarly the contents of the building may pose a significant hazard to firefighters. Information on such hazards is vital on the incident ground.

Crews may not be aware of changes made to the layout of the building, which could also affect fire development.

Fire and Rescue Services should encourage occupants of higher risk premises to have adequate information available on arrival (e.g. premise plan, boxes, knowledgeable staff etc).

Modern fire engineering has resulted in technology assisting in firefighting operations. An excess of alternative fire safety solutions have made recognition of specific provisions extremely difficult and reliance on 7(2)d information imperative. It should also be borne in mind, that such fire engineering, if used incorrectly, may have adverse effects on fire development.

HAZARDOUS SUBSTANCES/PROCESSES

Although the hazards present during firefighting operations are similar in most types of buildings, additional hazards may be present due to storage, or the processes undertaken at the premises and should be identified during Section 7(2)(d) visits. The hazards listed below can be found in a variety of premises, for example: hospitals, research facilities, universities, schools, factories, airports and docks and domestic dwellings:

- the presence of oxidising agents, hazardous chemicals, asbestos etc
- the presence of radioactive sources and/or non-ionising radiation
- biological hazards, including those from animals
- high voltage electrical equipment/machinery
- stored energy systems, e.g. pneumatic, hydraulic
- involvement of compressed gas cylinders e.g. liquefied petroleum gas, acetylene, oxygen, carbon dioxide, nitrous oxide etc
- exposure to laser equipment
- exposure to magnetism – magnetic resonance imagers (MRI)
- large quantities of liquid nitrogen
- guard dogs and other active security devices (e.g. smoke cloak)
- aerials/radio wave repeaters
- storage of explosives including fireworks.

The involvement of any of the above hazards in an emergency situation will seriously increase the risks to firefighters.

It must be appreciated that some hazardous substances/processes are carried out illegally (e.g. cannabis factories and other drugs manufacturing/processing/storage, fireworks, or the manufacture of improvised explosive devices).

Additional hazards may be encountered as the requirements imposed by legislative constraints will not have been acted upon. These may include:

- Effects of substances when involved in fire
- Lack of containment of substances/processes
- Unprotected machinery
- Lack of fire safety precautions
- Deliberately placed ‘booby traps’
- Violence (eg. manufacturers, dealers/users etc)
- Materials for production and explosion of improvised explosives devices
- Presence of confined or unconfined explosives
- Discarded or deliberately placed hypodermic needles

- There is an increasing amount of patients being cared for at home, rather than in the hospital environment. This has resulted in an increasing likelihood of oxygen cylinders or piped oxygen supplies being found in domestic premises
- Hydrogen powered electricity generators are now being marketed for small building and domestic use. These will create their own fire hazard and if involved in a fire will provide additional fuel and create a potential explosion hazard.

Some of the above hazards may be commonly found in other types of buildings. For example, hypodermic needles (sharps) or deliberately placed 'booby traps' may be found in domestic properties, frequently in areas of social deprivation.

Some types of premises will have machinery which may be affected by radio interference and therefore should be considered as part of familiarisation/pre-planning.

SMALL STRUCTURES

Residential caravans, domestic garages, garden sheds and storage sheds (worker's huts) on building sites, may contain hazards such as oxygen, acetylene and liquefied petroleum gas compressed gas cylinders, including small gas containers used for lighting and cooking. Hazards may also include quantities of fertilisers, pesticides, paints, solvents and petroleum or illegal substances.

Any of these types of structure involved in fire should be approached with caution with the expectation that the above hazards are present.

FIRE LOADING

The fire load represented by consumer goods, furnishings, fittings and fixtures affects the nature and spread of the fire and possibly the stability of the building. The housekeeping standards in the building and the general maintenance of the structure and services may also contribute to the fire loading. The effect of firefighting water on porous materials may contribute to the potential for collapse of the building.

Risk assessment during the incident should consider the extent and nature of the hazard potential of such issues.

MOVING MACHINERY

Manufacturing processes often expose firefighters to risks from moving machinery. Incident Commanders should ensure that all moving plant is isolated and all movement has stopped whenever possible.

It must be appreciated that in some circumstances it may be necessary to allow certain pieces of plant or machinery to continue running especially if they are risk/process critical. The isolation of this type of equipment could have a serious detrimental impact on the incident. It should also be considered that heavy and light plant vehicles such as fork lift vehicles may be used to clear the fire loading and prevent spread of fire.

REMOTE CONTROL OF PLANT

There is an increasing use of remotely controlled plant and equipment ranging from environmental control systems to the remote control of manufacturing processes and warehousing facilities. A typical example of this is the increase in the use of computerised

high-bay warehouses. Modern distribution centres and high-bay storage often contain automated forklift truck selection processes, which often travel faster than a person can run and no refuge is provided. These machines must be isolated prior to entry.

Remote operated or a mechanically operated equipment carried out automatically as part of a process can result in machinery becoming operative unexpectedly with tragic consequences. Entrapment, crushing or electrocution could result in such circumstances.

FLASHOVER, BACKDRAUGHT AND FIRE GAS IGNITIONS

Refer to GRA 5.8 - *Flashover, backdraught and fire gas ignitions*.

PROXIMITY TO NEIGHBOURING BUILDINGS

The distance between structures, particularly structures of timber construction may result in fire spread beyond the original building.

ELECTRICAL SYSTEMS ON EXTERNAL BUILDING FASCIAS

Electrical systems may be found in external positions on buildings.

These may include photo-voltaic panels and shop signs etc which present an electrical shock hazard, or shock track (electric) bird abatement systems, which although only being low voltage, may be hazardous if a firefighter were to touch it whilst at the head of a ladder.

REDUNDANT SOLID FUEL BACK BOILERS

When a redundant solid fuel back boiler is left in place it should be made safe by the removal of pipework or by providing a suitable vent to the boiler. If this isn't done, and a coal or wood fire is lit in front of the boiler, the unit is heated up sufficiently for the internal pressure to cause the boiler casing to explode. This will usually be the origin of an incident, but may occur during a fire in the building and should be considered by attending crews.

WORKING AT HEIGHT

Refer to *GRA 5.10 - Working at heights*.

DAMPING DOWN

Hazards are still present even after a fire is under control. It is possible that a greater number of hazards exist when damping down and turning over is in progress.

These include:

- toxic gases within the steam plume
- asbestos and other harmful waste
- hidden hazards caused by structural debris
- unsafe or unstable underfoot conditions
- risk of partial or total collapse of structure.

THE INVOLVEMENT OF PEOPLE

'Persons reported' type incidents are likely to prompt actions that involve increased risk to personnel. There is tremendous moral pressure on operational crews to do all they can to save life. This may increase the amount of risk that firefighters will take when dealing with the incident.

In addition, personnel may be confronted by the occupiers or owners who are anxious and potentially aggressive.

Working and environmental conditions

GAINING ENTRY

Prior to gaining entry to a building, if the availability of suitable, sufficient and in some cases, substantial firefighting media is not secured, personnel may be put at significant risk. Similarly any failure of water or equipment whilst undertaking firefighting will have severe consequences to personnel.

The consequences of inappropriate entry to either a building or a compartment involved in fire are:

- the creation of a flashover, backdraught, or fire gas ignition
- the intensification and spread of the fire
- injury to personnel due to incorrect manual handling techniques adopted whilst gaining access and using breaking in gear. (Refer to **manual handling** below).

Arrangements should be in place to facilitate this task in a way that minimises the risks involved.

Measures include the provision of specialist equipment, the adoption of safe working practices and practical training.

VENTILATION OF BUILDINGS INVOLVED IN A FIRE

Incorrect ventilation techniques or inappropriate ventilation may exacerbate the situation resulting in increased risk to personnel within the hazard area.

Refer to Generic Risk Assessment 3.6 – *Using positive pressure ventilation* and Generic Risk Assessment 5.8 – *Flashover, backdraught and fire gas ignitions*'

ATMOSPHERIC CONDITIONS

Large amounts of smoke and fumes will be encountered at building fires, particularly at commercial or industrial premises. Weather conditions will have an effect on the fire (i.e. strong winds will increase the severity of the fire and may increase the smoke in unexpected areas).

As stated in *Fixed Installations*, firefighters operating in damp personal protective equipment may result in steam burns when exposed to a hot atmosphere. This may be caused by sweat, rain, water sprays etc in addition to fixed installations.

NOISE

In addition to the general noise of the fireground, a particular noise hazard is that generated by explosion(s). It may be significant enough to cause hearing loss, disorientation or loss of consciousness. Cylinders, tyres and pressurised production lines may also create explosive noise.

Other sources of noise include:

- automatic fire alarms, particularly if unable to silence the unit on arrival
- machinery processes which firefighters are unable to isolate.

Some production systems include pressure relief plates as part of the safe systems of work. These are designed to fail as a safety device when under more pressure than normal. These normally fail into a safe area but in an emergency this area may be where firefighters are operating.

HEAT AND HUMIDITY

Working in hot and humid atmospheres can lead to serious physiological effects including fatigue and confusion. In consequence, performance levels deteriorate, decision making and manipulative skills reduce and vision is adversely affected.

SECURITY DEVICES

Some properties may have smoke emitting devices installed, which are designed to disorientate burglars in the event of a break-in. This could prove hazardous for the Fire and Rescue Service when attending incidents and could disguise the true nature of an incident, cause disorientation and hinder search procedures.

Self-closing/blocking doors in secure accommodation may prove hazardous to firefighters if they close behind them whilst they are carrying out seaches. Further information is available in Generic Risk Assessment 3.9 – *Fighting fires in secure accommodation*.

Some security alarms operate at a very high noise level. This poses a risk to firefighters who may enter the building as silencing these alarms is not always possible.

TERRAIN/CONDITIONS

Difficult terrain may be present for crews to negotiate (i.e. bad housekeeping internally or externally), or holes, debris etc which may be found at derelict property.

Fire and Rescue Services should encourage occupants in higher risk premises to have adequate information available on arrival (e.g. premises plan, boxes, knowledgeable staff etc).

Fumigation processes in commercial premises may result in automatic fire alarms being actuated. If owners/occupiers are not fully aware of this possibility and do not inform responding crews, personnel may be subjected to a respiratory hazard.

PSYCHOLOGICAL EFFECTS ON FIREFIGHTERS

Stressors caused by a failure of a safe system of work can have a cumulative effect on firefighters. These effects can result in failure of manipulative skills and cognitive reasoning.

Examples of stressors include:

- loss of communication with work teams or control points
- disorientation within the premises
- extremely hot and dark conditions
- dangerously low levels of air whilst 'rigged in' breathing apparatus away from a place of safety
- failure of firefighting media whilst in a high risk situation
- low levels of confidence whilst using unfamiliar pieces of equipment
- low levels of confidence when dealing with tasks at high risk incidents
- low light levels and poor visibility
- operating in darkness and smoke – therefore unable to see trip hazards and safety officers unable to see firefighters working etc.

RISK OF INFECTION

Personnel may be exposed to the hazards of blood-borne infections such as Hepatitis B and Human Immunodeficiency Virus (HIV) when dealing with casualties and fatalities. The main operational risk to personnel occurs if blood or body fluids come into contact with the eyes, mouth or broken skin, especially if the skin is punctured by a contaminated needle or other sharp object.

DEALING WITH ANIMALS, POULTRY AND CARCASSES

During the course of their operational duties, firefighters may have to deal with animals, poultry and animal carcasses. This exposes firefighters to the risks of the following:

- animal diseases which can affect humans e.g. ringworm, salmonella, leptospirosis/weils disease, bovine leptospirosis, chlamydophila psittaci, brucellosis, Q-fever, tuberculosis, anthrax and pneumonia
- physical injury including crushing, scratches and bites
- musculo-skeletal injuries due to difficult manual handling situations.

Additionally, the unpredictable nature of animals, particularly when frightened (i.e. when trapped or involved in a fire situation) can result in risk to firefighters.

Key control measures

Pre-planning

Pre-planning is key to enhancing the safety of firefighters and others likely to be affected by Fire and Rescue Service operations. Each Fire and Rescue Service's Integrated Risk Management Plan (IRMP) will set standards and identify the resources required to ensure safe systems of work are maintained.

Each Fire and Rescue Service should assess the hazards and risks in their area relating to this generic risk assessment and site-specific plans should be considered for locations where these are significant. This assessment should include other Fire and Rescue Service's areas where "cross border" arrangements make this appropriate.

Such contingency plans should include:

- levels of response
- relevant standard operating procedures
- tactical considerations. Including rendezvous points, appliance marshalling areas and access points.

Pre-planning is underpinned by information gathering, much of which will be gained through inspections or visits by Fire and Rescue Service staff – for example, those covered by section 7(2)d of the *Fire and Rescue Services Act 2004*.

Information should also be gathered and used to review safe systems of work etc. from sources both within and outside the Fire and Rescue Service, including:

- fire safety audits
- incident de-briefs
- health and safety events
- local authorities
- local resilience fora.

Involving others in pre-planning is also an effective way to build good working relations with partner agencies and other interested parties, such as site owners.

Fire and Rescue Services should ensure systems are in place to record and regularly review risk information and to make certain that new risks are identified and recorded as soon as practicable.

Fire and Rescue Services must ensure that the information gathered is treated as confidential, unless disclosure is made in the course of duty or is required for legal reasons.

Fire and Rescue Services should consider the benefits of using consistent systems and formats to record information from all sources. Consideration should also be given to how timely access will be provided to information to support operational decision making.

Information needs and the capacity of Fire and Rescue Service staff to assimilate information will vary in proportion to the nature and size of incident and what stage the operational response has reached. Arrangements need to be flexible and may be based on more than one system.

It is an explicit duty for Fire and Rescue Services to pre-plan for fighting fires in buildings. All areas of risk should be considered, including the risk to firefighters and other emergency responders, individual and societal risks, environment, community, heritage, economic and other risks.

Pre-planning 7(2)(d) to identify foreseeable hazards is essential in developing safe systems of work.

Key elements are as follows:

- personnel having the appropriate skills to identify hazards in design, construction and use of buildings
- suitable and sufficient resources of equipment and personnel arriving in a timely manner to allow the work activity to be executed safely
- personnel having the necessary training and maintenance of skills, with sufficient supervision to enable all safe systems of work to be carried out
- arrangements to be made for 'cross-border' working.

A staged approach for the collection and utilisation of risk information should be used when pre-planning for incidents. This will include:

- a review of information related to the site to determine the appropriateness of further information gathering
- gathering additional data by visiting the site or other means to provide sufficient information to assess the risk
- assessment of the level of risk to determine appropriate timescales and frequencies of visits
- the use of the assessment to determine appropriate control measures. this should be communicated to partner agencies and determine the levels of training to manage the risks
- the provision of operational information for use at incidents at bronze and silver commands and other appropriate control levels.

INADEQUATE PRE-PLANNING AND ALLOCATION OF RESOURCES

The Integrated Risk Management Plan process requires Fire and Rescue Services to plan for and procure sufficient resources to deal with all identified risks. If this is not done effectively it may result in insufficient resources being deployed and firefighting crews being placed at significant risk. There is a moral pressure on operational crews to do all they can to save life and property. This may increase the amount of risk that firefighters are willing to take whilst dealing with the incident.

Failure in pre-planning will result in the hazards being released.

Specific pre-planning for this Generic Risk Assessment should include:

INSUFFICIENT WATER SUPPLIES

The amount of water used during a fire fighting operation is limited by the flow available, this is usually the quantity that can be provided from the public distribution system. In the United Kingdom this could, theoretically, be as little as nine litres per minute, well below the level required to supply an effective fire-fighting jet but, nevertheless, within the statutory minimum that water companies must provide to domestic consumers. The

assumption that even this rate of flow will always be available is questionable given the assertion that climatic change provides the potential for disruption to water-resource systems. An issue that may not be adequately considered within fire service strategic planning.

Securing water supplies

There is a duty under the *Fire and Rescue Services Act 2004* to secure the provision of water supplies for fire fighting purposes. In practice, water companies provide the necessary water supply, but fire authorities are responsible for determining the location of hydrants and for their subsequent testing, repair and maintenance.

The general principle is that there should be operational cooperation between Fire Services and Water companies to determine actions that might be required to provide and secure water for fire fighting. The Fire Service are experts at assessing and planning the actions required to fight fires in any given circumstance. Water companies' expertise is central to the process of assessing and predicting the extent to which the distribution system can provide water for fire fighting. Providing and securing water for fire fighting is therefore a joint process balancing what might be required with what may be made available then agreeing actions to "fill the gap", if one exists.

Water companies and Fire Services have limited resources; therefore some form of priority ranking of risk assessments is required. Particular attention should be paid to those potential incidents that carry the greatest risk and might need significant resources to tackle a real incident. The provision of water for fire fighting requires careful preplanning that not only establishes need but goes on to identify the sources of water, whether drawn from public water mains or other sources, and then secures availability for use in case of fire.

Risk assessment

Dependent upon the potential for larger fires to occur, it may be necessary for the Fire Service to consider securing greater supplies of water than those immediately available from the nearest hydrant. In these cases it would be appropriate to apply a risk assessment methodology which could be used in identifying the sources of water for fire fighting purposes and can be based on either a site specific basis for large, isolated and high risk premises or generic assessments for other areas such as city centres or industrial estates. It may be appropriate to consider both probability and consequences of fire in determining satisfactory arrangements during risk assessments. Risk assessment may also be considered by the water companies in assessing or predicting the effects of drawing large quantities of water from their network when large scale fire fighting operations are carried out.

SITE SPECIFIC RISK INFORMATION (SSRI)

The process of site specific assessment is achieved through the auspices of Section 7(2)(d) of the *Fire and Rescue Service's Act 2004* (as amended). The collation and dissemination of site specific risk information is a process that involves a number of tasks:

- selecting premises to be inspected

- assessing the nature and magnitude of the risk
- considering a proportionate level of response
- recording the significant findings
- making sure that the information is available in a useable form.

A site-specific assessment will take account of 7(2)(d) inspection information and will include information relating to the preplanning of firefighting tactics.

In the case of buildings under construction or demolition, each site will have its own specific project plan based on the nature of the building, its geographic location and time constraints. Consequently, it may be necessary for Fire and Rescue Services to compile suitably specific pre-attack plans for the project as a whole, or indeed at specific stages of the project.

Many major projects will be made known to Fire and Rescue Services through local authority building control departments. It is, therefore, imperative that Fire Safety Departments liaise closely with their own Services Operational Departments to allow appropriate plans to be compiled.

For demolition/dangerous buildings, the Incident Commander of a fire will need to decide whether to adopt an offensive or defensive mode of firefighting, based on an assessment of the risk to firefighters against the benefits of saving the building.

Asbestos will be present in many buildings, particularly those built or altered between 1950's and mid 1980's.

NOTE:
Asbestos containing materials were banned in 1999.

UTILITIES

The gas supply to the building should be isolated if it involved in the incident. If the gas is ignited it should not be extinguished other than by carefully shutting off the gas supply on the instruction, and under supervision of the supply engineers.

The electricity supply should be isolated to obviate the danger of firefighters coming into contact with exposed wiring.

There may be occasions, when consideration may have to be given to leaving power supplies switched on, if the benefits outweigh the disadvantages. For example, safety critical operations that may be found in hospitals may be adversely affected. In such situations firefighters must be informed that the power supplies have not been isolated.

Overhead hazards such as hanging wires, overhead cabling etc, which, if not affixed appropriately to the ceilings or walls, (or in the event of cable trays in false ceilings falling loose), can become affected by heat and fire conditions. These may impede safe access (either by becoming a trip hazard or present a risk of electrocution), and more importantly, egress for both firefighters and members of the public.

Training

When formulating a training strategy Fire and Rescue Services should consider the following points:

- Fire and Rescue Services must ensure their personnel are adequately trained to deal with hazards and risks associated with fighting fires in buildings
- The level and nature of training undertaken should be shaped by informed assessment of operational and individual needs in accordance with the Fire and Rescue Service guidance on the integrated personal development system, national occupational standards and any internal training plan
- Training and development should follow the principles set our in national guidance documents. Training and development programmes should generally be structured so that they move from simple to more complex tasks and from lower to higher levels of risk
- Training and development will typically cover standard operational procedures as well as ensuring knowledge and understanding of equipment and the associated skills that will be required to use it
- Training and development programmes need to consider the need for appropriate levels of assessment and provide for continuous professional development to ensure maintenance of skills and to update personnel whenever there are changes to procedures, equipment etc.

Training outcomes should be evaluated to ensure that the training provided is effective, current and meets defined operational needs as determined by the Fire and Rescue Service's Integrated Risk Management Plan.

Command and control

The Incident Commander should follow the principles of the current national incident command system. Prior to committing personnel into any hazard area, the Incident Commander must take account of the information available about the incident to make operational decisions in what are recognised as sometimes dangerous, fast moving and emotionally charged environments.

A thorough safety brief prior to deployment of personnel within the hazard zone must be carried out.

Safety Officer(s)

The early appointment of one or more Safety Officer(s) will help ensure that risks are either eliminated or reduced to an acceptable level.

A safety decision-making model should be used to brief Safety Officers regarding the nature of the incident, the allocated task and prevailing hazards and risks. The Incident Commander should confirm that the Safety Officer understands:

- their role and area of responsibility

- allocated tasks
- lines of communication.

Those undertaking the Safety Officer role should:

- be competent to perform the role
- ensure personnel are wearing appropriate personal protective equipment
- monitor the physical condition of personnel and/or general or specific safety conditions at the incident, in accordance with their brief
- take any urgent corrective action required to ensure safety of personnel
- update the Incident Commander or senior safety officer regarding any change in circumstances
- not be engaged in any other aspect of operations, unless this is required to deal with a risk critical situation.

The role of a Safety Officer can be carried out by any of the fire service roles, but the complexity of the task, size of the incident and scope of responsibility should be considered by the Incident Commander when determining the supervisory level required.

Safety Officers should wear nationally recognised identification to indicate they are undertaking the “Safety Officer” role.

Fire and Rescue Services should ensure that training and other measures (such as aide-memoires) are in place and available to support those staff liable to undertake this role.

Personal protective equipment

Fire and Rescue Services must ensure that any personal protective equipment provided is fit for purpose and meets all required safety standards. When choosing suitable protective garments, the standard of clothing worn beneath the specialist personal protective equipment should also be taken into account. Consideration should also be given to the selection of suitable sizes and gender specific requirements of personal protective equipment.

Personal protective equipment should also take account of the need for rescuers to be visible against the operational background including night working and for the Incident Commander and other managerial and functional roles (defined in the national incident command system) to be distinguishable.

All personnel must use appropriate levels of service provided personal protective equipment and respiratory protective equipment as determined by the safe system of work.

In addition to the practical risks involved in firefighting, personnel may be exposed to blood-borne infections when dealing with casualties. The risk can be minimised if personnel ensure good personal hygiene and carry out good occupational infection protocols.

Where chemicals/radiation etc risks are identified, correct personal protective equipment should be provided and selected.

Safe systems of work

Fire and Rescue Services should have Standard Operating Procedures procedures for dealing with fires in buildings

The operational procedure adopted will depend upon the conditions encountered at each individual incident.

The dangers associated with building/compartment fires are well known within the Fire and Rescue Service, therefore firefighters should not enter the risk area to fight a fire or carry out search and rescue operations without adequate extinguishing media.

AUTOMATIC FIRE ALARMS AND SECURITY DEVICES

Firefighters should not work in areas where a fire alarm or burglar alarm has been actuated, unless the alarm is silenced. Alternatively, where an alarm cannot be silenced and personnel must work in the area, suitable hearing protection must be provided. In such circumstances, appropriate measures must be undertaken to maintain suitable communication with personnel in the affected area.

POST INCIDENT

The following measures should be considered to help eliminate or remove risks after an incident, as appropriate to the nature and scale of the incident.

- Any safety events; personal injuries, exposure to hazardous substances or near-misses should be recorded, investigated and reported in line with legislative requirements such as Reporting of Injuries Diseases and Dangerous Occurrence Regulations 1995, etc
- Arrangements should be in place to either remove all contamination from personal protective equipment or ensure it's safe and appropriate disposal and to check that personal protective equipment maintains the agreed levels of integrity and protection for the wearer throughout it's lifecycle
- As appropriate, occupational health support and surveillance follow up
- Conduct a de-brief to identify and record any "lessons learned" from the incident. De-briefs will range in complexity and formality, proportionate to the scale of the incident and in line with individual Fire and Rescue Service procedures
- Consider any changes required to safe systems of work, appliances or equipment in the light of any lessons learned from debriefs or from safety events
- Consider the need to review existing information held on a premises or location, or the need to add a new premises or location into future preplanning e.g. by adding to visit or inspection programme

- Staff should be supported and monitored to identify whether they are experiencing any adverse affects and to check whether they would benefit from accessing counselling and support services
- Consideration should be given to arranging for staff to make a contemporaneous written record of their actions. This information may be used to assist in any internal or external investigations or enquiries that follow any incident e.g. coroners court, public enquiry, etc.

Technical references	
1	Fire Service Manual Vol. 2, Compartment fires
2	Fire Service Circular 8/1986 Part C: Roof Membranes using Fluoro-Carbon Polymers
3	Fire Service Circular 5/1991: Houses of Multiple Occupation and the Local Government and Housing Act 1989
4	Dear Chief Officer Letter 5/72: Air Supported Structures
5	Dear Chief Officer Letter 20/72: Firefighting in Automated High Bay Warehouses
6	Dear Chief Officer Letter 13/81: A study of a Large Fire in a Covered Shopping Complex 1977
7	Dear Chief Officer Letter 6/89 Part B: Access Difficulties Posed by Security Doors
8	Dear Chief Officer Letter 7/91: A Survey of Tools and Methods for forcing Entry through Security Doors – CFBAC report #41
9	Dear Chief Officer Letter 4/94: Addendum to TB 1/93 Operational incidents in tunnels and underground structures
10	Dear Chief Officer Letter 4/94: Internal thermo-cladding building panels
11	Dear Chief Officer Letter 3/96: Light insulating Sandwich panels
12	Dear Chief Officer Letter 13/97: Fire Risk Assessment in nucleus hospitals
13	Dear Chief Officer Letter 14/97: CFBAC Summary report #76: Fire Safety of sandwich panels
14	Dear Chief Officer Letter 15/99: Fire behaviour of insulating core panels used for internal structures (sandwich panels)
15	Fire and Rescue Service Manual vol. 2: Fire Service Operations, Incident Command – 3rd Edition 2008
16	Fire Brigades Response Options Study Final Report FRDG Publication number 6/97
17	Fire and Rescue Service Circular 55 – 2004: The Building Disaster Assessment Group – Key Research Findings
18	Fire and Rescue Service Circular 32 – 2006: *Fighting Fires in High Rise Buildings* (Generic Risk Assessment Review)
19	The Building Regulations 2000, Fire Safety, Approved Document B, Volume 2 – Buildings other than Dwelling Houses, 2006 Edition – Communities and Local Government
20	Fire and Rescue Service Circular 7/2009 – Publication of Research Reports – Computer modelling of Basement Fires
21	Fire Research Report 5/2005 Firefighting in Under Ventilated Compartment Fires
22	Fire Research Report 26/2008, Computer Modelling of Basement Fire, Part 1
23	Fire Research Report 28/2008, Computer Modelling of Basement Fires Part 2
24	FSR 2/2005 Physiological Assessment of Firefighting Search and Rescue in the Built Environment

25	HSE Safety Alert – 'Risks from redundant solid fuel back boilers' – HSE website 12.05.08
26	HSE Operational Circular 334/5 Supplement 1
27	1/2005 Operational Physiological Capabilities of Firefighters; Literature Review and Research Recommendations
28	The Fire Cover Review October 2002 and technical Papers
29	Loss Prevention Standard – LPS 1181: 2003: Part 1: Issue 1
30	Loss Prevention Standard – LPS 1181: 2003: Part 2: Issue 1
31	Fire Safety of Sandwich Panels Summary Report – FRDG
32	Firefighting Options for fires involving Sandwich Panels
33	Statutory Instrument 2006 No. 3318 (Regulation 16B)
34	BRUFMA Information Document ID/2001
35	Building Control Fire Safety Panel, Fire Safety Information Note – Fire Behaviour of Bonded Sandwich Panels

Glossary

Chlamydophila psittaci

A lethal intracellular bacterial species that causes endemic avian epizootic outbreaks in mammals and respiratory psittacosis in humans. Chlamydophila psittaci (previously classified as Chlamydia psittaci) is transmitted by inhalation, contact or ingestion, by birds and mammals.

Psittacosis

Also known as parrot disease, parrot fever, and ornithosis. Contracted from parrots, cockatiels, budgerigars, pigeons, sparrows, ducks, hens and other species of birds. Psittocosis in birds and humans often starts with flu-like symptoms and becomes life-threatening pneumonia.

SECTION 2

Summary of Generic Risk Assessment 3.1 Fighting fires in buildings

Construction and design

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
1	Fighting fires in large premises (e.g. uncompartmented, unsprinklered, single storey etc)	Increase level of thermal radiation due to uncompartmented area	Fire spread burns/scalds	FRS personnel, other agencies, members of the public	Operational procedures, personal protective equipment, analytical risk assessment
		Difficulty locating area of the building affected by fire	Delay in applying extinguishing media/ deterioration of the incident, heat stress	FRS personnel, members of the public	Operational procedures, training/instruction, risk information (7(2)d)
		Structural collapse in early stages of fire	Impact/skeletal injury burns/scalds crush	FRS personnel, members of the public	Operational procedures, training/instruction in the different types of building construction and risk information 7(2)d, command and control
		Likelihood of fire spread to other buildings or structures due to higher level of radiated heat	More intense/spread of fire	FRS personnel, other agencies, members of the public	Operational procedures, training/instruction, command and control.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
2	Buildings of complex design or construction (e.g. vertical shafts, extensive ducting, extensive atria or widespread modifications)	Complex access arrangements, Difficulty locating the fire	Delay in applying extinguishing media/ deterioration of the incident Heat stress	FRS personnel Employees Members of the public	Operational procedures Training/instruction
		Communication difficulties on the incident ground	Breakdown of the incident command system	FRS personnel Members of the public	Identification of areas of poor communication during 7(2)d inspections
		Potential for open areas over lower levels, (e.g. balconies walkways over voids etc)	Falls from height	FRS personnel	Operational procedures Training/instruction.
3	Fighting fires in buildings with modern methods of fire engineering	Insufficient information available to use methods of fire engineering	Burns/scalds	FRS personnel Other agencies Members of the public	Technical information Operational procedures Training/instruction 7(2)d visits Personal protective equipment.
4	Fighting fires in buildings used as retail buildings	Factories, cold stores, industrial units, warehouses, food processing plants, supermarkets etc	Sandwich panel construction leading to unexpected fire spread or collapse Large volume of smoke Limited ventilation	FRS personnel Employees Members of the public	Operational procedures and instruction of crews Command and control of incident including analytical risk assessment, to keep crews out of the risk area Personal protective equipment – fire gear Training enabling recognition of the structure and hazards

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
		Being exposed to fixed installations	Inhalation/overcome by fumes (e.g. CO_2 and inert gases)	FRS personnel	Training and instruction regarding the hazards and precautions to take with fixed installations Identification of premises with fixed installations for the isolation and control of fixed installations Personal protective equipment to protect the airway and exposed areas of the body Training
			Burns and scalds caused by saturation of personal protective equipment from water based installation	FRS personnel	Operational procedures Personal protective equipment
		Unearthed steel framed, steel clad structures	Electrocution Death	FRS personnel Employees Members of the public	Training and instruction regarding this risk Command and control Training of crews to recognize the types of hazard that may be incurred
		Unguarded pits/cellars	Falls from height Death	FRS personnel Employees Members of the public	Operational procedures BA Provision of thermal image camera Training and instruction of crews Command and control training to recognize the possibility of the hazard.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
5	Fighting fires in buildings used as educational establishments	Sandwich panels, or CLASP construction	Undetected fire travel/ intensity Possibility of collapse	FRS personnel Members of the public	Operational procedures for dealing with sandwich panels Training and Instruction on the above Analytical risk assessment of the incident Suitable and sufficient training to identify the type of construction Command and control of incident to keep crews out of risk areas.
6	Fighting fires in domestic dwellings	Overhead canopy at entrance to property, over source of fire	Abnormal fire development Burns	FRS personnel Members of the public	Operational procedures Personal protective equipment Training/instruction.
7	Fighting fires in buildings containing asbestos	Asbestos used in various construction/ insulation applications	Contamination	FRS personnel Members of the public	Operational procedures Personal protective equipment Training/instruction.

Summary of Generic Risk Assessment 3.1 Fighting fires in buildings

Contents and Use of the Building

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
8	Fighting fires in large premises (e.g. uncompartmented, unsprinklered, single	Presence of high voltage apparatus including transformers/ sub-stations	Electrocution Fire	FRS personnel Members of the public	Operational procedures Personal protective equipment Training Breathing apparatus
		Lack of control over the nature of goods or storage systems (which can determine the rate of fire growth)	Excessive fire spread	FRS personnel Members of the public	Risk information 7(2)d).
9	Building complex design of construction (e.g. vertical shafts, extensive ducting, extensive atria or widespread modifications)	Materials/equipment (for processing/use), which may impact on fire development	Burns and scalds	FRS personnel	Operational procedures Training/instruction
		Collapsing racking/ shelving	Impact injuries Burns Structural collapse	FRS personnel Members of the public	Operational procedures Personal protective equipment Breathing apparatus.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
10	Fighting fires in buildings used as retail buildings	Hanging overhead cabling etc, which has been affected by heat/ fire	Impeding access/ egress of presenting as an electrocution hazard	FRS personnel	Provision of thermal image camera Personal protective equipment – fire gear Suitable and sufficient training using breathing apparatus
		Leak of gas mains or other pressurized gas system (e.g. liquid petroleum gas, oxygen, nitrous oxide etc)	Burns/scalds Explosion Structural collapse Blast injury	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction Personal protective equipment
		Fire/burglar alarm or machinery not isolated due to it not being involved in the incident. Explosives, cylinders, tyres and pressurized production lines creating explosive noise	Excessive noise resulting in noise induced deafness or impaired hearing	FRS personnel	Operational procedures to ensure isolation of alarm as soon as possible Command and control and supervision of crews to reduce exposure FRS personnel having the necessary skills and training to identify risks involved in the activity Personal protective equipment – ear plugs/ defenders Health surveillance of crews following incidents if necessary
		Cylinders/aerosols	Increase fire spread or explosion Death or serious injury	FRS personnel Members of the public Employees	Operational procedures Personal protective equipment 7(2)d Training

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
		Exposure to pneumatic/hydraulic equipment	Pressure injury or being struck/crushed Death or serious injury	FRS personnel	Personal protective equipment
		High levels of fire loading (e.g. consumer goods, furnishings etc)	Increased fire spread	FRS personnel Members of the public Employees	Operating procedures (firefighting) Command and control of the incidents to ensure efficient deployment of resources Training and instruction of crews
		Broken luminous discharge tubes or other exposed electricity	Electrocution	FRS personnel	Personal protective equipment Operational procedures for breathing apparatus Provision of thermal image camera Personal protective equipment – fire gear Training using breathing apparatus Isolation of power source.
11	Industrial premises	Unprotected machinery	Cuts and contusions Impact/skeletal injury Puncture wound Death and serious injury	FRS personnel Other agencies Members of the public	Operational procedures Personal protective equipment Training
		Exposure to machinery (remotely controlled, unable to isolate leaks or accidental operation)	Crush, entrapment or contamination Death and serious injury	FRS personnel	Training and instruction Operational procedures 7(2)d visits

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
		Exposure to hazardous substances during operations	Inhalation/overcome by hazardous fumes Absorption or ingestion of harmful particles Death or serious injury	FRS personnel	Training and instruction Operational procedures Supervision of crews undertaking the task Personal protective equipment Breathing apparatus command and control.
12	Fighting fires at hospitals, research facilities, universities, schools, factories, airports and docks	Hazmats, asbestos etc. Radiation/non-ionising radiation Biological hazards High voltage Stored energy systems (e.g. pneumatic, hydraulic etc.) Compressed gas cylinders	Burns/scalds Fire/explosion Structural collapse/crush Electrocution Disease/ill health Absorption/ingestion/inhalation of particle Blast injury	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction Command and control 7(2)d visits Personal protective equipment
		Laser equipment Magnetism (i.e. MRI) Small amounts of chemicals in laboratories	Cold burns Asphyxiation	FRS personnel	Operational procedures Personal protective equipment Breathing apparatus 7(2)d visits
		Release of liquid nitrogen Steam lines (particularly in hospitals)	Burns and scalds	FRS personnel Members of the public	Personal protective equipment Breathing apparatus.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
13	Fighting fires in cold stores	Sub zero temperatures Release of refrigeration gasses	Slipping on ice Asphyxiation	FRS personnel	Operational procedures for fighting fires in cold stores Personal protective equipment 7(2)d inspections.
14	Fighting fires in domestic dwellings	Presence of '*sharps*'	Needle stick injuries	FRS personnel Members of the public	Training/Instruction on operational procedures 7(2)d visits PPE – fire gear, surgical gloves etc. Health surveillance following possible contamination
		Oxygen cylinders, or piped oxygen supplies (for treating patients at home)	Fire Explosion Structural collapse Blast injuries Injury from projectiles	FRS personnel Members of the public	Operational procedures Personal protective equipment Training/Instruction
		Hydrogen powered electricity generators	Fire Explosion Structural collapse Blast injuries Injury from projectiles	FRS personnel Members of the public	Operational procedures Personal protective equipment Breathing apparatus.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
15	Fighting fires in caravans, garages, sheds and other small structures	Presence of liquefied petroleum gas cylinders, fertilizers, pesticides, pains, solvents or illegal substances Rapid fire spread	Burns/scalds Fire/explosion Blast injury Death	FRS personnel Members of the public	Operational procedures Training/instruction Personal protective equipment.
16	Firefighting at premises which are operating illegally (e.g. cannabis factories or other drugs manufacturing/ processing/storage, fireworks or IED's) Unmarked ISO Containers	Effects of hazardous substances when involved in fire	Burns/scalds Contamination Fire/explosion Inhalation/overcome by fumes	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction Personal protective equipment Breathing apparatus
			Absorption/ingestion/ inhalation of particle	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction Personal protective equipment
		Lack of containment of substances/processes	Contamination	FRS personnel	Operational procedures Signs Personal protective equipment
		Unprotected machinery	Impact/skeletal injury Injury from projectiles	FRS personnel	Operational procedures Training/instruction Personal protective equipment

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
		Lack of fire safety precautions Rapid fire spread	Burns/scalds Fire/explosion	FRS personnel	Operational procedures Training/Instruction Technical information
		Deliberately placed 'booby traps'	Burns/scalds Contamination Fire/explosion Electrocution Impalement Death	FRS personnel	Operational procedures Training/Instruction Command and control Personal protective equipment
		Violence (eg. manufacturers, dealers/ users etc.)	Physical assault	FRS personnel Other agencies Members of the public	Operational Procedures. Training/Instruction PPE
		Explosion of improvised explosive devices	Burns/scalds Blast injury	FRS personnel Other agencies	Operational procedures Training/Instruction
		Presence of confined or unconfined explosives	Blast injury Burns/scalds Death	Members of the public	PPE.
17	Electrical systems on external building fascias	Personnel being '*shocked*' at top of ladder whilst fighting fire/rescuing from upper floors via ladder	Electrocution Falls from height	FRS personnel	Technical information PPE 7(2)d inspection.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
18	Fighting fires in buildings fitted with redundant solid fuel back boilers	Potential for unit to explode	Burns/scalds Explosion Blast injury Injury from projectiles Death	FRS personnel	Operational Procedures Training/Instruction PPE.

Summary of Generic Risk Assessment 3.1 Fighting fires in buildings

The Nature of the fire and Operational Tasks

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
19	Buildings of complex design or construction (e.g. vertical shafts, extensive ducting, extensive atria or widespread modifications	Unusual patterns of fire spread and behavior	Burns and scalds	FRS personnel	Training/instruction
20	Fighting fires in domestic dwellings	Animals/exotic pets	Inflicting bites/ scratches/stings	FRS personnel Other agencies Members of the public	Operational procedures Analytical risk Assessment on actions to be taken PPE to protect exposed areas of the body Use agencies with experience in dealing with animals Health surveillance (where necessary) to prevent infection
			Animal diseases	FRS personnel Other agencies Members of the public	Operational procedures Analytical risk Assessment on actions to be taken PPE to protect exposed areas of the body Experience in dealing with animals Health surveillance (where necessary) to prevent infection.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
21	Fighting fires in building producing illegal substances such as drugs	Exposure to chemicals used during manufacture of drugs etc	Contamination	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction PPE
		Methamphetamine etc, improvised explosive devices Triacetone Triperoxide – (TATP) etc	Narcotic effects Chronic ill health issues Death	FRS personnel Other agencies Members of the public	Training PEP BA FRSC 28/2007 *'Fire Service Risk Management for Methamphetamine and other illicit drug laboratories'*
		Lack of containment of substances	Containment	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction PPE BA.
22	Gaining access to building fire	Flashover/backdraught/ fire gas ignitions/ explosions	Burns and scalds Death	FRS personnel	Training and instruction on the signs of backdraught Operational procedures to be adopted Supervision of responding crews PPE to be worn Command and control over action of crews.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
23	Offensive firefighting	Being exposed to flashover/Backdraught/ Fire gas ignitions uncontrolled spread of fire, heat and humidity, or uncontrolled ventilation	Burns and scalds Metabolic heat Stress/heat syncope Chronic ill health effects Death	FRS personnel	Training and instruction on operational procedures and the awareness of the effects of working in extreme temperatures and recognition of the symptoms of heat disorders Operational procedures (gas cooling procedures) PPE to protect exosed areas of the body.
24	Defensive firefighting	Flashover/ Backdraught/fire gas ignitions/uncontrolled ventilation	Impact and skeletal injury caused by flying debris Fire and explosion leading to blast injuries Structural collapse of the building on to personnel Burns and scalds received from the building openings Death	FRS personnel	Refer to GRA 5.8.
25	Preventing fire spread to neighboring properties	Uncontrolled spread to adjacent buildings	Fire spread Structural collapse	FRS personnel Members of the public	Operational procedure Command and control.
26	Working at height	Fragile surfaces, damaged roofs, missing floors, railings or other edge protection	Falls from height due to holes in floors/collapse Death	FRS personnel	Operational procedures Training/instruction.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
27	Manual handling operations at building fire	Use of breaking in equipment	Sprains and Strains Manual handling injury	FRS personnel	Operational procedures Training/Instruction
		Handling large unwieldy, sharp edged or heavy objects	Sprains and strains Manual handling injury Cuts and contusions Chronic illness	FRS personnel	Operational procedures Training/instruction.
28	Damping down operations	Exposure to asbestos	Contamination Disease/ill health/death	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction PPE.
29	Involvement of people	Deliberately placed '*booby traps*'	Slips, trips and falls Cuts and contusion Falls from height Burns/Scalds Contamination Fire/explosion Structural collapse Electrocution Disease Overcome by fumes Puncture wound Blast injury Injury from projectiles Death	FRS personnel Other agencies Members of the public	Operational procedures Training/Instruction PPE BA.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
		Violence by members of the public	Cuts and contusions. Puncture wound Injury from projectiles	FRS personnel Other agencies	Operational procedures Training/instruction PPE.

Summary of Generic Risk Assessment 3.1 Fighting fires in buildings

Working and Environmental Conditions

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
30	Fighting fires in large premises (e.g. uncompartmented, unsprinklered, single storey etc)	Rapid smoke generation and travel	Delay in applying extinguishing media/ deterioration of the incident Heat stress	FRS personnel Members of the public	Operational procedures Training/Instruction.
31	Fighting fires in buildings used as retail buildings	Smoke emitting security devices	Exposed to increased levels of smoke	FRS personnel	Operational procedures for BA Provision of thermal image camera PPE – BA.
32	Fighting fires in domestic dwellings	Burglar/fire alarms	Noise induced deafness/impaired hearing	FRS personnel	Operational procedures PPE (hearing protection) Health surveillance to determine the possibility of any long term damage.

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
33	Gaining access to the building on fire	Entry through doors, windows and other openings	Slips, trips and falls whilst climbing or lowering down from opening	FRS personnel	Operational procedures and training Analytical risk Assessment of the task PPE (e.g. gloves, fire gear etc) Experience of the crew
			Sprains and strains, whilst trying to maneuver through the opening		
			Cuts and contusion from broken glass.		
			Creation of flashover/ Backdraught/fire. gas ignitions conditions		
		Use of breaking in gear/cutting gear	Sprains and strains due to incorrect manual handling techniques	FRS personnel	Training and instruction of crews Supervision of activity being undertaken PPE (e.g. gloves, fire gear etc) Experience of crews to identify safest method to be adopted
			Chronic illness’		
			Cuts and contusions on sharp areas	FRS personnel	Operational procedures and training Risk Assessment of the task PPE (e.g. gloves, fire gear etc)
			Impact or skeletal injury due to unexpected movement of structure	FRS personnel	Operational procedures and training Analytical Risk Assessment of the task PPE (e.g. gloves, fire gear etc)
			Puncture wound from sharp/protruding objects	FRS personnel	Operational procedures and training PPE (e.g. gloves, etc).

Ref. No.	Task	Hazard	Risk	Persons at risk	Control measures
34	Offensive firefighting	Maneuvering inside buildings, locating and handling casualties	Slips, trips and falls due to being unable to see obstacles Manual handling Sprains and strains caused by handling casualties	FRS personnel FRS personnel	Training and instruction Operational procedures (BA).
35	Defensive firefighting	Maneuvering around outside of building	Slips, trips and falls due to uneven ground, or debris Chronic illness	FRS personnel	Training and instruction Operational procedures Supervision of crews Command and Control PPE for the protection of the head and body Command and Control on the incident ground.
36	Ventilation of buildings involved in a fire	Inappropriate use or initiation of ventilation	Flashover, Backdraught and fire gas ignitions Burns/Scalds Death	FRS personnel Members of the public	Operational procedures Training/instruction.
37	Atmospheric conditions during building fire	Smoke, and hazardous fumes from fire in the vicinity	Inhalation/overcome by fumes Death	FRS personnel Other agencies Members of the public	Operational procedures Training/instruction BA.
38	Working in. and around the fireground during hot weather	High ambient temperatures	Dehydration Chronic ill health effects	Fire and rescue personnel	Operational procedures and training PPE.