



FIRE SAFETY - THE ROLE OF TRAINING

White Paper by Graham Holloway, MD of Vulcan Fire Training

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Introduction

Recent high profile fires serve to highlight the dangerous and destructive nature of uncontrolled fire.

The cost of fire damage to UK business runs into many millions of pounds, and the projected loss of income to the UK economy is in excess of **£1.1 billion** annually.

Behind these figures lie many harrowing individual cases where organisations and individuals have suffered very large financial losses and all too often these incidents can be accompanied by tragic human consequences.

“ The cost of fire damage to UK business runs into many millions of pounds.

Significant business interruption is an inevitable consequence of such disasters, and even where much of the initial loss is covered by insurance, this only has the effect of deferring the costs to subsequent years premiums, and the actual losses are almost always far in excess of the insured losses. The effects of major fire incidents are often reflected on the bottom line, long after the physical effects of the fire damage have been rectified.

Another crippling business effect of any major fire is the amount of management time consumed; both directly connected with the actual incident, and also in relation to the trauma of dealing with the aftermath and consequences of the event.

In common with other major health and safety incidents, investigations following a serious fire almost always conclude that had effective and robust fire safety management systems been in place, the incident would either not have occurred, or at the very least the effects and consequences would have been minimised.

Another common link are the acts, or omissions, of groups or individual's that can be shown to have caused or contributed to the incident.

Hindsight almost always highlights a simple remedy. The facts are that in the early years of the 21st century, the technology, the systems and information to prevent and/or control unwanted fires exists and is readily available, and much can be done to significantly improve fire safety without spending vast amounts of money.

So realistically what can be done?

“ Investigations conclude that effective and robust fire safety management systems could prevent or minimise consequences of fire.

Ignorance is Lethal – Competence is King

Ignorance is nothing to be ashamed of, it simply refers to our lack of knowledge or awareness on some particular issue. We are all ignorant of many things in this world without there being disastrous consequences.

However some individual's ignorance of their role in fire safety precautions is a contributing factor in almost all major fire incidents. This lack of knowledge ranges from shop floor staff being unsure how to respond to a fire in the workplace, to management and key staff who are uncertain of the requirements of legislation and what are deemed to be adequate fire safety measures in their particular circumstances.

“ An individual's ignorance of their role in fire safety precautions is a contributing factor in almost all major fire incidents.

The Role of Training

The role of training in any walk of life is to bring about a change of individual's behaviour and increase personal competence.

Perhaps a simple overview of the four states of personal competence that we all occupy on various issues may be helpful.

Level 1

Unconscious Incompetence – we all occupy this state on many things in life, we don't know about it, we don't even know if we should know about it, therefore we don't worry about it.

This is probably the origin of the phrase 'Ignorance is Bliss'.

Level 2

Conscious Incompetence – this is a very much more uncomfortable state and almost all of us reside here on a number of issues. We know about it, we know we should find out more, we know we should do something about it – but for various reasons we don't get round to it.

This is a familiar state for many of us who occupy positions of responsibility and it can be very uncomfortable and unattended to can contribute to all the well-known symptoms of stress.

Level 3

Conscious Competence – This is better, we know about it, we know what to do, or where or how to get the necessary skills or information – we're in control and able to act appropriatelyproviding we think about it and act consciously, deliberately and carefully.

We have not yet developed automatic responses but we can get the job done when the need arises.

Level 4

Unconscious Competence – This is the land of the accomplished expert, where actions have become almost automatic and we can operate effectively seemingly without conscious thought.

Thankfully we all occupy this the most comfortable of states on many work related and life skills issues.

These states are perhaps best understood when related to a well known set of common skills. The complex set of skills required to drive a car are a good illustration, progressing from total ignorance at some time in our lives, through the trauma of learning to drive and passing the test (Levels 2 and 3), to the highly skilled state of having safely arrived at the selected destination but not being able to recall anything about particular parts of the journey (Level 4).

It is the role of training to encourage individuals to progress through these competence levels to the one that is most appropriate in the circumstances. A fire risk assessment should determine the level and frequency of fire training required in an organisation.

What is the appropriate level of personal competence in fire safety?

If we are to improve the fire safety in our organisation, what level of personal competence in fire safety is appropriate for the various levels of staff in the workplace?

Clearly **Level 1 'Unconscious Incompetence'** is inappropriate.

The Regulatory Reform (Fire Safety) Order 2005 state that fire training should be provided for the workforce on induction to the company, and fire awareness training on a regular basis i.e. at least once every 1-2 years.

“ If staff are expected to behave appropriately in an emergency then they must know what's expected of them.

If staff are expected to behave appropriately in an emergency then they must at least have the necessary information on what's expected of them.

If this minimum requirement is provided it may leave them at **Level 2 'Conscious Incompetence'** (the uncomfortable one), so perhaps additional practical activities such as regular fire alarm checks and practice evacuations will help bring people up to **Level 3 (Conscious Competence)**.

In most organisations ensuring that adequate procedures are in place, that staff know what's expected of them in an emergency, and have had the opportunity to practice the required actions will go a very long way to prevent fire safety incidents becoming a major disaster.

Training

There is clearly a need for this level of training for the workforce and this falls neatly into two clear categories of training need as outlined here.

1. Induction Training

At the start of their employment induction training should be provided, preferably on their first day with the organisation and should include:

- An overview of the fire hazards in the area where they will work;
- The location and use of the escape routes from where they are working;
- The location, operation and meaning of the fire warning system where they are working.

2. Fire Awareness Training for Existing Staff

To compliment the training of new employees, all staff should be trained in fire awareness.

Simply carrying out fire drills or showing staff a fire extinguisher video every year is not really appropriate as effective fire awareness training.

**Fire responsibility has now been transferred from the DCLG to the Home Office.*

The *Department for Communities and Local Government and the Scottish Ministers have produced fire guides for different types

of existing workplaces which give guidance to organisations to compile an emergency plan, following their initial fire risk assessment.

This plan should include clear instructions for the people working and occupying the building on the following topics:

- The action employees should take if they discover a fire;
- How people will be warned if there is a fire;
- How the evacuation of the workplace should be carried out;
- Where people should assemble after they have left the workplace and procedures for checking whether the workplace has been evacuated;
- Identification of key escape routes, how people can gain access to them and escape from them to places of safety;
- The fire-fighting equipment provided;
- The duties and identity of employees who have specific responsibilities in the event of a fire;
- Arrangements for the safe evacuation of people identified as being especially at risk, such as contractors, those with disabilities, members of the public and visitors;
- Where appropriate, any machines /processes/ power supplies which need stopping or isolating in the event of fire;
- Specific arrangements, if necessary, for high-fire-risk areas of the workplace;
- How the fire brigade and any other necessary emergency services will be called and who will be responsible for doing this;
- Procedures for liaising with the fire brigade on arrival and notifying them of any special risks, e.g. the location of highly flammable materials; and
- What training employees need and the arrangements for ensuring that this training is given.

These then are the topics that should be included in fire awareness training, so that everybody understands what is expected of them for a safe fire evacuation.

This is a significant undertaking (but a legal requirement) and many organisations that carry out fire awareness training report that the best they can hope for is to train 85% of their workforce. The collection of accurate fire training records is therefore also important.

A significant number of organisations questioned admitted to carrying out no fire training at all. Using our stages of competence model, it follows that Managers and/or Safety professionals in these organisations are residing in Levels 1 or 2 regarding fire safety training – yet another training need!!

Providing Induction and Fire Awareness training will do much to save lives, but will not necessarily be effective at minimising the financial and business risks associated with a major fire.

Organisations, through their safety professionals, can do much more to prevent minor incidents from becoming major disasters.

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Fire Safety Managers

Fire Safety Managers have significant responsibilities and potentially a greater training need than others in an organisation. The fire safety manager's role is normally nominated to the health and safety advisor/professional for the company.

“ Most professional health and safety training will not fully equip a health and safety professional for a fire safety manager role.

In the current climate of self-regulation with the various Enforcement Bodies policing the Regulatory Reform (Fire Safety) Order 2005, the safety professional requires a very practical and in-depth knowledge on many aspects of fire safety, to equip them to confidently meet with enforcement officers or building control officers to discuss and agree fire safety matters relevant to their workplaces.

Despite fire safety being an integral part of health and safety, most professional health and safety training and qualifications will not fully equip a health and safety professional for this role.

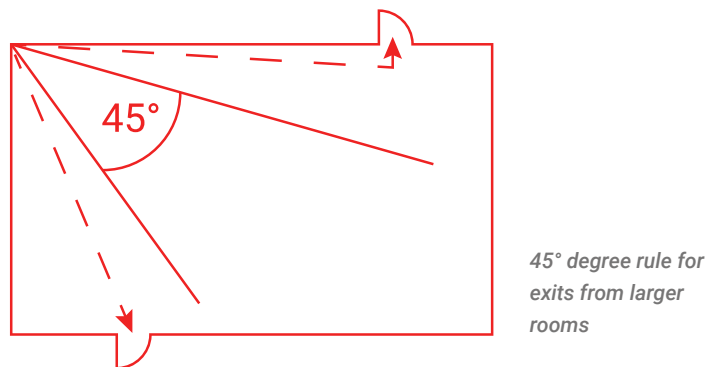
Training of Fire Safety Managers should provide a good understanding of the following:

Fire Safety Provisions

The basic fire safety provisions in the workplace are the foundation of good fire safety management:

- Are the means of escape adequate?
- Where do we measure travel distances from?

- Have inner rooms or inner, inner rooms been constructed?
- Has the 45° degree rule been satisfied for alternative means of escape where two or more existing rooms are to form one large room?
- Are fire protected routes at least ½ hour fire resisting construction and clear of fire hazards?
- Does a tea room need a self-closing device on the fire door provided?
- Can an electro-magnetic door closer or similar device be fixed to a staircase fire door?



These are all pertinent questions that the fire safety manager should be able to answer regarding means of escape.

The location of fire assembly points is also very important, they should be in a place of safety not a cul-de-sac, and have sufficient capacity for all occupants of the workplace. A position of safety is at least 15-20 metres clear of the building (much further away in high rise buildings) due to the threat of radiated heat, falling debris, building collapse and backdraughts deflagrating from the building at 15 metres per second at 1500°C.

A tragic cinema fire some years ago in France resulted in more than 156 customers being evacuated to a secure vandal proof car park adjacent to the building – having evacuated the building all were unable to escape over the high wire fence and locked gates and were tragically killed by radiated heat.

Fire Warning Devices

Fire control panels are the heart of a fire alarm system and should normally be located so that it can be seen from a building final exit.

- Where are fire alarm call points and alerting devices such as sounders and flashing lights to be located?
- How far can we travel to a fire alarm call point?
- What is the required sound level of the warning sounder?
- When is automatic fire detection required and what detector is suitable?

Fire Fighting Equipment

How many and what type of fire extinguishers are required, where do we locate them?

- Do we have too many fire extinguishers? (Invariably the answer to this question is yes.)
- Can fire engines still reach all access points on our site, or have changes been made to the width, height or parking arrangements on site?
- Are dry rising mains required?
- When do we require a wet rising main?
- Are smoke extracts required from basements?
- Can the fire service gain access to all parts of the workplace in safety?

Again Fire Safety Managers require a good grasp of these and other related matters.

With developing technology, the fire safety manager also needs a good grasp of the fixed fire fighting installations available in the marketplace. The alternative systems available need to be investigated and appropriate action taken as soon as possible.

Fire Risk Assessments

Fire risk assessments are a legislative requirement and must be carried out by a competent person. Without a working knowledge of basic fire safety provisions a risk assessor will be hard pressed

to carry out meaningful fire risk assessments that are suitable and sufficient.

- What Fire Risk Assessment system should be used?
- Will the fire service be happy with its content and format?

It is essential that a fire risk assessment be carried out both inside and outside the workplace. Quite often external fire risks such as combustible storage too close to buildings, or long uncut grass or undergrowth will be significant exposure risks to the buildings and facilities on a site.



Timber pallet storage can present a considerable fire hazard.

A working knowledge of fire legislation is also essential including case histories of recent and past cases. General fire safety management knowledge should include the keeping of records, writing fire emergency plans, training requirements for the company, the use and storage of hazardous/combustible materials. Timber pallet storage too close to buildings presents arsonists with the ideal fire load to set fire to the adjacent buildings and property.

An understanding of established and developing trends and the common causes of fire are essential elements in the training of fire safety managers, along with information on how many fires occur in workplaces, how many people are killed or injured in workplaces? Etc.

“ Arson has been the largest single cause of workplace fires over the past 10 years, and is now responsible for over 40% of all recorded workplace fires each year.

Arson has been the largest single cause of workplace fires over the past 10 years and is now responsible for over 40% of all recorded workplace fires each year. Larger City Fire Brigades record malicious ignition as the cause of over 60% of the incidents that they attend. Arson control methods and assistance in fire investigations are therefore also important skills for the effective safety manager.

Fire Fighting Policy

When it comes to actually fighting a fire, many organisations appear to have the policy that staff evacuate the building and do not fight fires with the portable equipment provided.

“ All workplaces should be provided with means for fighting fire, for use by people in the premises.

This tends to be the advice given by many fire authorities but this is not the position of the Health and Safety Executive (HSE). The HSE employers guide states that *“portable fire extinguishers enable suitably trained people to tackle a fire in its early stages, if they can do so without putting themselves at risk.”*

The guide also advises that *“All workplaces should provide means for fighting fire for use by people in the premises.”* DCLG Guide*.

Other Key Staff Training Needs

If we are to prepare staff to fight these small fires and prevent them becoming major incidents, the training of key staff is required under current fire safety legislation, otherwise why do we install fire extinguishers in the workplace? The fire service usually uses their own equipment so it's not for their benefit!

Effective and memorable fire extinguisher training can be achieved using acronyms like 'PASS' (originating in the USA).

- | | |
|-----------------|-----------------------------------------------------------------------------------|
| PULL | Pull the pin or clip. |
| AIM | Aim the nozzle at the fire. |
| SQUEEZE | Squeeze the handle together to make the agent discharge. |
| SWEEPING | Use a sweeping motion from bottom to top or front to back to extinguish the fire. |

*Fire responsibility has now been transferred from the DCLG to the Home Office.

Who to Train

It is logical to train fire wardens and staff working in high fire risk areas to use the fire fighting equipment available. The basic safety rules should be applied to ensure staff do not tackle a fire that is too big for them. The following basic rules of thumb work very well and give staff confidence.



Practical fire fighting session by a special needs group using fire simulator

- Do not fight a fire whose flames are bigger than the average persons body;
- Assess the smoke being produced - is it thick and black?
- Assess the surrounding risks that are likely to become involved - are they flammable or combustible?
- Have another person backing you up - do not fight a fire on your own;
- Always use the appropriate extinguishing agent;
- Never let the fire get between you and your way out;
- Keep low below the heat, smoke and flames;
- If the fire is getting bigger - get out.

To ensure staff are familiar with, and confident in, the use of fire extinguishers it is important that they practice their use on a 'real fire' (they need to achieve '**Conscious Competence**').

The use of fire simulators will allow a controlled 'hands on' fire extinguisher training session with no danger to staff, and with the minimum of pollution to the environment. The old 'oil fire trays' have fallen foul of Environment legislation and are no longer best practice.

People Working in High Risk Areas

Staff working in areas such as kitchens or with highly flammable materials should be trained in the procedures to be adopted.

Best practice will involve having them trained to use appropriate fixed or portable fire fighting equipment for the risks present.

Fire Wardens

Fire warden training should be geared to safely evacuating the workplace and, if appropriate, to tackle the fire. Wardens should be trained to implement the company fire procedures as contained in the fire action notices and fire emergency plan.

Fire evacuation procedures should be as simple as possible as over complicated procedures can cause confusion in the 'heat of the action', and become a possible danger to the occupants of the building.

Effective Fire Wardens training usually takes ½ to one day and again a useful and memorable acronym for Fire Wardens duties is RACE:

“ Over complicated procedures can cause confusion in the 'heat of the action', and become a possible danger to the occupants of the building.

Remove people from the immediate vicinity of the fire;
Alarm - ensure that the fire alarm is activated and also that the fire brigade has been called;
Contain the fire by closing doors as the room is clear of people;
Evacuate the building using the nearest escape route provided to the fire assembly point.

Wardens trained to attack fires should only consider doing so following a quick assessment of the fire, with somebody backing them up, and should commence at the point when the occupants are in the evacuation stage.

Arrangements must be in place to ensure the last person to evacuate should report that their area is clear, with the exception of the two people fighting the fire.

To improve their understanding Fire Wardens should have a good knowledge of:

- The common causes of fire;
- The five classes of fire;
- The fire triangle;
- Three main methods of fire spread;
- How fire develops;
- The backdraught phenomena.

Other essential ingredients in the fire warden syllabus are:

- Bomb procedures and how they differ from the fire procedures;
- An overview of fire legislation;
- Methods of removing people from the building, especially those with special needs and visitors;
- Safe practical fire fighting;
- Fire safety provision in your workplace.

Fire Safety Training – The Future

Fire training has always been an important part of fire prevention. The challenge for all those involved in this important task is to overcome some of the barriers that currently prevent far too many organisations from even attempting to implement effective fire safety training.

“ Uncontrolled fire represents the single largest risk to business.

Perhaps the key is convincing senior managers that uncontrolled fire represents the single largest risk to their business, that this risk can and must be minimised and that training to improve the fire safety competence of the workforce is a cost effective measure.

With self-regulation placing greater demands on organisations to provide adequate information, instruction and training, the drive for continual improvements in safety performance and the accompanying need to positively influence the fire safety behaviour of the workforce, can only increase the need for effective training.

However the days of showing an occasional fire extinguisher video will no longer fit the bill.

About the Author



*Graham Holloway, MD of Vulcan
Fire Training*

Graham Holloway is the MD of Vulcan Fire Training. He has worked as a senior officer in the London Fire Brigade, a Fire Adviser to the USAFE air bases in the UK, and a Battalion Chief with the Saudi Arabian Oil Company in Dhahran where he wrote the procedures and trained the company emergency response team for chemical weapon attack during the Gulf War.

In his work with various training providers he has developed a fire safety training portfolio suitable for all levels of staff, from workforce and fire wardens through to fire safety managers and senior staff.

Vulcan Fire Training is accredited by the Institute of Fire Safety Managers as a training centre and recognised by the Institution of Fire Engineers for its higher level courses, as well as the MOD as part of its Enhanced Learning Credits Scheme. The British Fire Consortium also recommends the Vulcan courses as part of its members' progressive learning scheme.



Vulcan Fire Training Co Ltd

Tall Trees

Gig Lane

Thelwall, Warrington

Cheshire

WA4 2SP

01925 211488

www.vulcanfiretraining.co.uk