



**Fire Brigades Union**  
The professional voice of your firefighters

# **“Firefighter fatalities at fires in the UK: 2004–2013: Voices from the fireground”**

**An independent report by Andrew Watterson**

Occupational and Environmental Health Research Group, University of Stirling, Scotland

**Funded by the Fire Brigades Union**

## Introduction

Matt Wrack, FBU general secretary

Firefighters go to work to assist people in their hour of need, whether it is a rescue at a fire, cutting them out of car crashes, dealing with the effects of flooding, or every other imaginable kind of hazard. Firefighters go to work to help others; we do not go to work to die ourselves.

The Fire Brigades Union (FBU) commissioned Professor Andrew Watterson, a highly-regarded occupational safety and health specialist from the University of Stirling to assess recent UK firefighter fatalities.

In particular we asked Professor Watterson to examine the deaths of firefighters at fires, including fatalities at Marlie Farm (2006), Atherstone (2007), Dalry Road (2009) and Shirley Towers (2010). In the UK over the last ten years, 14 firefighters have died in the line of duty. Through exhaustive research on official reports, investigations, legal documents and interviews with key stakeholders, the report identifies significant lessons from past fatalities that need to be learned.

The FBU wanted this report to focus minds on what can be done to improve public safety and firefighter safety. We believe it does that and much more. The report:

- calls for the direct and indirect role of central and senior local government and brigade managers in firefighter fatalities to be addressed
- provides detailed recommendations to address structural and functional failures that threaten firefighter health and safety; and
- recommends action to improve risk assessment, risk management and training.

Professor Watterson concludes that 'good practice has sometimes been ignored'. The FBU is acutely aware that all risks cannot be removed from the service, but we insist that the risks can be reduced by positive action from fire and rescue services, local and central government, and regulatory and inspection bodies.

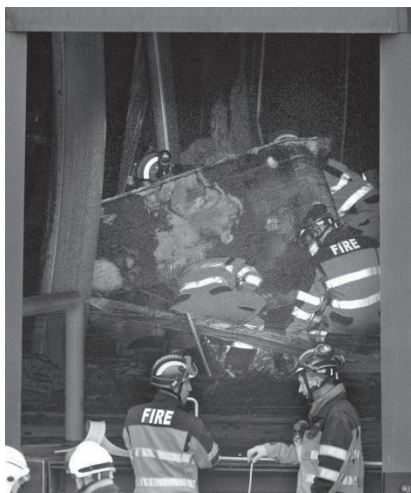
It is important that we begin to identify the role played by central government, senior local government and brigade managers. These are the people ultimately responsible for the laws, budgets, staffing, systems, training, equipment and resources that our members rely on.

We fear that radically reduced budgets for the service will lead to more firefighter deaths and injuries. This report demonstrates a need for investment, not cuts to the fire and rescue service. Budget cuts mean reductions in training, staffing, equipment and fire stations and continued operational duties of older firefighters. This will lead inevitably to further fatalities in the future.

Firefighters should expect to be able to go home to their families after their day's work. Firefighters assess the risks and take carefully planned action to rescue people, to deal with incidents and to make communities safe. Our members have the right to demand the best possible procedures, training, equipment and resources to enable us to do our job safely, effectively and professionally. That is not too much to ask.

This report cannot be filed, ignored or left for another day. Fourteen have died at fires in the past decade. We owe it to the firefighters killed and injured in the recent past to review all our systems now. The FBU calls on governments and brigade principal managers to treat this report with the same urgency that it would if 14 politicians weren't going home to their loved ones.

FBU officials will be seeking urgent meetings with all stakeholders to discuss this report and what action will be taken for our safety.



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Briefing paper for MPs based on the

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“....for firefighting, the principal work activity is hazard engagement, which is usually further complicated by extreme time pressure. The customary safety strategy in many high hazard work situations is to implement multiple safety measures, or what is sometimes referred to as ‘defenses in depth’ (Kunadharaju, Smith and Lejoy 2011 on US firefighting)



Credit to Press Association for picture

**This research has been funded by the Fire Brigades Union**



## ABBREVIATIONS

ADSU	Automatic Distress Signal Unit
ARA	Analytic Risk Assessments
BA	Breathing Apparatus
BAECO	Breathing Apparatus Entry Control Officer
BIS	UK Government's Business, Innovation and Skills Department
CFBAC	Central Fire Brigades Advisory Council
CFBT	Compartment Fire Behaviour Training
CFRA	Chief Fire and Rescue Advisor
CFRAU	Chief Fire and Rescue Advisor's Unit and Chief Fire and Rescue Advisory Unit
CFOs	Brigade Chief Fire Officers
CFOAs	Chief Fire Officers Association(s)
CHAF	Control of the Hazards associated with the Transport and Storage of Fireworks
CLG	Communities and Local Government
COP	Code of Practice
COPFS	Crown Office and Procurator Fiscal Service, Scotland which contains the COPFS Scottish Fatalities Investigation Unit (SFIU)
COSLA	Convention of Scottish Local Authorities [Scottish local authority body]
CPS	Crown Prosecution Service, England and Wales
DCLG	Department for Communities and Local Government
DCOL	Dear Chief Fire Officer Letters
DRAs	Dynamic Risk Assessments
ESF[R] S	East Sussex Fire and later Rescue Service
ESFA	East Sussex Fire Authority
FAIs	Fatal Accident Inquiries
FBU	Fire Brigade Union
FOA	Fire Officers Association
FOI	Freedom of Information
FRS(s)	Fire and Rescue Service(s)
GRAs	Generic Risk Assessments
GMFRS	Greater Manchester Fire and Rescue Service
HeFRS	Hertfordshire Fire and Rescue Service
HFRS	Hampshire Fire and Rescue Service

HMIFs	Her Majesty's Inspectors of Fire
HSE	Health and Safety Executive
HSL	UK Health and Safety Laboratory
HASAWA	Health and Safety at Work Act
IC	Incident Commander
IRMPs	Integrated Risk Management Plans
ISO	International Organization for Standardization
LBFRS	Lothian and Borders FRS
LFB	London Fire Brigade
LGA	Local Government and Local Government Association, England
LRD	Labour Research Department
MAIB	Marine Accident Investigation Board
MSER	Manufacture and Storage of Explosives Regulations
NAO	National Audit Office
NHS	National Health Service
NIFRS	Northern Ireland
NIOSH	US Government's National Institute of Occupational Safety and Health
ODPM	Office of the Deputy Prime Minister
ONS	Office for National Statistics
PDA	Pre-determined attendance
PORIS	Provision of Operational Risk Information Systems
PPE	Personal Protective Equipment
REEMA	Reed and Malik Company
RIDDOR	The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
SFBAC	Scottish Fire Brigades Advisory Council
SFIU	COPFS (Crown Office and Procurator Fiscal Service, Scotland) Scottish Fatalities Investigation Unit
SFRS	Scottish Fire and Rescue Service
SMEs	Small and Medium Sized Enterprises
SOPs	Standard Operated Procedures
TIC	Thermal Imaging Camera
WFRS	Warwickshire Fire and Rescue Service

## Summary

In the last ten years, the UK has witnessed a horrific series of 14 firefighter/fire technician fatalities at fires in what is a relatively small national workforce - Bethnal Green in London 2004 (2); Harrow Court in Hertfordshire 2005 (2); Marlie Farm in East Sussex 2006 (2); Atherstone in Warwickshire 2007 (4); Dalry Rd in Edinburgh 2009 (1); Shirley Towers in Hampshire 2010 (2); Oldham St. in Manchester (1) 2013. In England alone between 1993/94 and 2003/04, there were 6 firefighter deaths at fires but in the next ten years 2004/05 to 2013/14 this more than doubled in the UK with 13 firefighter deaths and one fire technician death. One firefighter in Wales was killed in 2004 in an explosion due to a criminal act. Often these fatalities occurred in similar settings and similar circumstances. In the same period there has also been a series of serious injuries to firefighters at fires and other major incidents and an unknown number of near misses. Whilst the risks of firefighting are obvious, the scale of death and injury is unacceptable. Many risks can be avoided if appropriate management and systems, inspection and regulation, training and other related matters are in place. Good practice that exists has periodically been ignored so the problem is compounded by lessons slowly learnt, communication of information stifled, by lengthy legal wrangles creating a justice deficit and by organisational denials of accountability.

The reports by brigades on these fatalities rarely, if ever, identify and acknowledge the direct and indirect roles that central government and senior local government and brigade managers play in such events. Yet these bodies and their 'directors' are ultimately responsible for the laws, budgets, staffing, systems, training, equipment and resources, information, procedures and specific standard operating procedures that the firefighters on the fireground have to rely on or use and the threats that they create.

There should be defences in depth that run from the top of government, through regulators and brigades to the fireground - vital to protect firefighters on the fireground in all incidents- yet on occasions they have been missing and firefighters have been left defenceless and lost their lives. Risks may not have been 'highly calculated', assessed and reduced. Such risks cannot be removed but they can normally be managed far better by fire services, local and central government, and regulatory and inspection bodies.

Additionally, any cuts now in budgets, training, staffing, equipment and fire stations and continued operational duties of much older firefighters may also have serious future impacts on firefighter safety at fires and these impacts may not emerge for some time. It is neither cost-effective nor morally acceptable to cut vital fire services in ways that may endanger both public and firefighter safety.

This report, drawing on interviews with firefighters themselves as well as inquiries, inspection reports and trial papers, provides a series of detailed recommendations to address the continuing threat of firefighter fatalities at fires and their direct and indirect causes.

## KEY RECOMMENDATIONS

### Statistics and other data availability

The four UK countries should publish annual reports on firefighter fatalities, injuries and near misses at fires as well as occupational disease rates and details of any related enforcement notices - drawing on information already available within the Health and Safety Executive (HSE), Department for Communities and Local Government (DCLG) and the individual Fire and Rescue Services (FRSs) across the UK

- HSE should make available all reports of completed investigations of firefighter fatalities on its web pages that are not restricted by ongoing legal cases. This should be done as expeditiously as possible;
- Each FRS across the UK should publish, including on its web pages, injury statistics and details of completed investigations of firefighter deaths at fires. This should be done as expeditiously as possible. There are examples of good practice to draw on: the NIFRS for example has an excellent data base on injuries to firefighters;
- Each FRS should provide annual web-based reports on firefighter health and safety. These data should currently exist but may be 'hidden' from public view in brigades;
- Within the office of the Chief Fire and Rescue Advisor (CFRA), the data available under 1 and 2 should be evaluated on a regular basis and used to produce publicly available annual or biennial reports as the CFRA has a strategic role;
- FRSs and the CFOAs should provide regular publicly available reports on firefighter fatalities at fires and any other major incidents serious injuries and diseases and significant near misses when they occur and when they are legally able to do so.

### Government departments across the UK including the CFRA office

- The better regulation and red tape challenge agendas of the government have not been properly evaluated. There is little evidence to show that in practice fire health and safety laws, regulations and codes are applied when they should not be or that they weigh down the economy. Where such agendas are not relevant to fires, they should be abandoned;
- The four governments should introduce occupational and public safety and health impact assessments prior to pursuing new policies and legislative changes that may affect firefighter and public safety. The costs of cuts in firefighter staffing, resources and not carrying out occupational health and safety activity in terms of human, social and economic damage should always be considered. These will balance regulatory impact assessments that focus on the costs of regulating and not the costs and consequences of not regulating;



- The departments should ensure that funding for fire safety is adequate and that measures it takes do not weaken the implementation of any of its regulations and guidance on fire safety;
- To achieve and facilitate the above, the departments should ensure that there is a properly funded and staffed CFRA office or its equivalent. The CFRAs would be able to carry out audits under and inspect FRSs to check that public safety and firefighter safety measures are in place and effective;
- Hence the CFRAs or HM Fire Inspectorates should develop a programme to ensure all FRSs are reviewed with regard to their work both on community safety and firefighter safety;
- The economic costs of such an office and unit would be partly covered by the reduction in firefighter fatalities, injuries and diseases, as well as by improvements in public safety, and so should be cost effective. Currently many of the costs of firefighter deaths and injuries are offset within the NHS and by communities and families of those affected firefighters;
- CFRA/Chief Fire and Rescue Advisor's Unit (CFRAU) information should be widely disseminated along with key findings on fatalities and guidance on actions in the future to prevent such fatalities. This should entail a review of the fitness for purpose of Rule 43 letters from coroners or their equivalent to ensure much wider and quicker dissemination of key findings as well as action on them;
- A fire safety and health forum, with all relevant stakeholders invited, should be re-established and funded by governments. It should serve all four UK countries. This should be linked to the development of better means for DCLG and others to engage with firefighters effectively in producing technical and other documents relating to fire health and safety;
- The DCLG and similar ministries in the other countries should urgently set up a review of the failure of some brigades to act rapidly on recommendations from fire fighter fatality at fires reports. Almost all of the fatalities discussed in this report, it should be noted, occurred post-2004. The CFRAs/HMIFs would be able to check national audits in brigades and inspect them including ensuring actions were taken on Rule 43 letters. CFRA reports should be widely disseminated along with key findings on fatalities and guidance on actions in the future to prevent such fatalities.

## Laws

- Governments should prioritise public health and firefighter safety legislation over financial considerations. There is no evidence of either a compensation culture existing among firefighters or a trivial approach to health and safety operating in firefighting and there is widespread agreement about the hazards of the occupation;
- Governments should ensure the health and safety impact of changes (and related possible adverse economic effects) on or reduction of laws, regulations, codes of practice and guidance relating to fire are as carefully assessed as the economic costs and consequences of bringing in new legislation.

### IRMPs produced under DCLG Guidelines and related lower level brigade plans

- IRMPs and related lower level plans should be reviewed in terms of their effectiveness with regard to addressing the occupational health and safety of firefighters. This should end the conflict between planning effective fire services and dealing with budgetary matters which have sometimes been conflated within IRMPs;
- DCLG should accept the FBU call that the government 'issue a circular immediately to advise that fire and rescue authorities must have regard to the 'Fire and Rescue Authorities – health, safety and welfare framework for the operational environment, published in June 2013, when developing their IRMP';
- Departments in the meantime should require all FRSs to document and audit their commitment to and record on firefighter health and safety in every IRMP they produce;
- The Fire and Rescue National Frameworks for England 2012 and Scotland 2013 should be revised, where necessary, to ensure firefighter health and safety is fully embedded within them and effectively prioritize the activity along with public safety. Similar checks should be made on the Welsh and Northern Ireland 'frameworks'.

### **Local government - the Local Government Association England (LGA) and other similar bodies in Wales and Northern Ireland within in the UK**

- Local authorities and their umbrella bodies should carry out good quality and rigorous occupational health and safety impact assessments of any proposed cuts in fire services. These assessments would include the economic consequences of cuts in the same way that regulatory impact assessments assess costs of regulations and proposed regulations;
- Local authorities should re-assess the requirements needed for a safe fire service that will protect both the public and its own firefighters and make adequate budgetary provision to meet those requirements in the light of recent fire fighter fatalities;

- If public expenditure cuts prevent local authorities fulfilling these requirements, then local authorities and bodies such as LGA may need to challenge such cuts and ensure that their electorates and their employees are fully informed about the implications of the cuts to the public and fire safety;
- LGA should evidence how they do and will audit and do and will prioritise firefighter safety effectively as well as public safety in their respective FRSs;
- Through LGA and other public bodies, local authorities should be prepared to produce a UK-wide consolidated annual report on firefighter fatalities, injuries and diseases unless this is already done by national governments or HSE. The reports could be based on those from Brigade Chief Fire Officers (CFOs) who should produce a public consolidated brigade report each year on firefighter fatalities, injuries and significant near misses and actions that have been taken to improve firefighter safety documenting any good practice;
- In 2014, COSLA, the Scottish local authority body, no longer had responsibility for fire as brigades had been consolidated into one national body, the Scottish Fire and Rescue Service;
- The 'self-regulation' model for checks on local authority fire services created by central government and adopted by local government should be abandoned as it has failed to prevent several of the fire fighter fatalities discussed in this report. There should be a move back in all four countries to formal regulation and national inspections of fire brigades drawing on a reconfigured CFRA office and, where necessary, re-established and independent HMIFs.

### **UK Fire and Rescue Services (FRSs)**

- Examples of good practice in investigating and/or addressing health and safety that exist in all four countries should be systematically rolled out more quickly and widely;
- Both fire fighters and fire officers' roles and workload need to be urgently re-assessed relating to the prioritisation of myriad, increasing and sometimes conflicting tasks that impact directly and indirectly on occupational health and safety;
- FRSs should re-assess the nature, scope and application of systems affecting fire fighter safety especially with regard to the respective weightings given to behavioural and safe systems of work and effective high level risk management. This should help to further inform assessments and re-assessments of the workings and fit of generic risk assessments (GRAs), dynamic risk assessments (DRAs), Analytic Risk Assessments (ARA) and related standard operated procedures (SOPs);

- Greater emphasis should be given to how defensive firefighting decisions are or are not taken in the light of recent incidents, the key principles of fire risk management and the impact of HSEs' 'Heroism' and 'striking the balance' outputs;
- FRSs should urgently review the extent to which they have fully implemented Rule 43 letters and incident reports on fire fighter fatalities at fires in so far as they have the authority to do so and document their findings;
- All FRSs should review or revise specific aspects of their policies and procedures on firefighting where incident reports indicate this is necessary including information and training for control room staff;
- FRSs should also where necessary re-assess external factors that have contributed to past fire fighter fatalities including the need for sufficient fire stations, sufficient trained and experienced firefighters, the right equipment, control rooms able to provide and receive accurate and rapid information on fires;
- FRSs should also, where necessary, address more specific factors that contributed to previous firefighter fatalities and ensure they address the health and safety of those on the fireground.
- This would include for example:
  - ensuring there is relevant, realistic , revised and regular training including the means to ensure relevant 'comprehensive' experience - where possible - for firefighters on incident command, fire and building science, standard operating procedures, GRAs and how they influence SOPs, DRAs and ARAs, risk management, BA usage, control and monitoring and other equipment training and experience, compartment and other search patterns, working in high temperatures and its effects, water supply to fires and to firefighters etc;
  - These factors may be viewed as the 'bread and butter' of the fire service but it is very clear from examining past fire fighter fatalities that have occurred that they are not.
- The firefighters interviewed wanted FRSs and support bodies to ensure there are more effective approaches to bridging the theory/practice/experience gaps for fire officers in training and review activities. This was particularly pressing in incident command and control, especially control, as a number of the firefighter fatalities had occurred sometimes long after fire fighters had reached the fireground;
- Better mechanisms and practices are needed across the UK to improve and prioritise FRSs' investigations of fatal incidents to ensure they are as transparent and collaborative as possible. Currently the position is patchy.

### Recommendations on risk assessment, risk management and related matters

- Risk assessment and risk management approaches generally embedded within legislation, related official guidance and fire service and brigade documentation should be reviewed again. This should be done not just for single incidents but across all fatalities. Clarity, applicability, comprehensibility, accessibility, utility and user-friendliness on the fireground of risk documentation should be re-assessed. Where necessary, tools and documentation should be revised so they are fit for purpose;
- In the light of firefighter concerns about the particular problems with analytical risk assessments, ARAs should be reviewed along with the role of fireground 'health and safety officers'. In this context, the LFB development of monitoring officers should be fully evaluated and rolled out more widely if effective;
- Operational risk information systems, if supported by relevant and accurate information may provide a UK-wide means to improve risk assessment and risk management. However, systems need to be fully tested for effectiveness and compatibility across the UK before they are introduced;
- Risk assessment, risk management and its application in practice may present particular problems for retained firefighters and firefighting in rural and remote areas. These potential problems should be more openly recognised and the best solutions available to address them should be discussed across the UK.

### **Legal matters - courts, inquests, Fatal Accident Inquiries (FAIs), Coroners and the Police including the Crown Prosecution Service (CPS) (England and Wales), the Crown Office Procurator Fiscal's Scottish Fatalities Investigation Unit (Scotland) and the Director of Public Prosecutions (Northern Ireland).**

- 'As justice delayed is justice denied', there should be a speeding up of processes relating to inquests, fatal accident inquiries and trials for workplace fatalities along with more resources and political will to pursue such cases;
- Improved, expanded and increased training and briefings by CPS and other appropriate bodies is needed for UK police forces on manslaughter and corporate manslaughter and related laws that may apply when firefighter fatalities occur;
- This should focus on building constructive relations with all parties involved, including FBU and avoiding confrontational, vexatious and incorrect investigations that have occurred in past incidents. There are examples of good and bad practice in police handling of fire fatalities and good practice should be rolled out;
- There should be a review of the effectiveness of Coroners' Rule 43 letters and their limited take up by some fire brigades. Such a review may wish to consider better means to roll out recommendations and monitor their uptake. Training of coroners in utilising expert witnesses and writing comprehensive Rule 43 letters with regard to firefighter fatalities and related matters may be of value.

## HSE

- HSE should ensure there are sufficient staff and resources available to oversee the work of the fire services properly with regard to the health and safety of firefighters;
- HSE should review its current guidance and reports on firefighter health and safety;
- Data indicate that enforcement action by HSE is very limited, although quite possible, in the light of serious health and safety breaches by brigades. HSE should review its enforcement policy in the light of recent employer failures to safeguard fire fighters. It is unlikely that governments will introduce new or more stringent laws on fire safety in the near future but HSE should enforce existing laws better;
- HSE should set up a new and regular inspection programme of FRSs to check that the findings of previous fatality reports and other evidence of hazards to firefighters – safety and health - are being fully implemented across the UK. This should be planned and extend beyond a simple paper and tick box exercise;
- HSE should provide clear and publicly available (not informal) guidance to employers and employees on the priority that should be given to firefighter health and safety by employers;
- HSE reports on fire fighter fatalities should be made available as fully, quickly and publicly as possible along the US lines for all to benefit from the information and analyses provided;
- Future research by HSE should target major upstream threats and risks to firefighter health and safety and not marginal human resource topics;
- HSE should draw on the extensive documentation of fire fighter fatalities that it has on file to extend and improve its advice to UK FRSs. Currently HSE does not appear to have a coherent picture of the key elements causing fatalities but only a fragmented view;
- Consideration should be given to the establishment of a 'fire investigation unit' along the line of the Marine Accident Investigation Board (MAIB) or Air Crash Investigation bodies. Such a unit could pool resources from across HSE, CFRAU and the Fire Services College at Morton in the Marsh to investigate serious fire incidents.

## The Chief Fire Officers Association (CFOA)

- The CFOA in conjunction with LGA, etc should produce a publicly available annual report on firefighter fatalities, injuries and near misses and actions that had been taken across all FRSs to improve firefighter safety documenting any good practice;
- This could be based on consolidating information that would always be included in an improved IRMP for each FRS and should include a commentary on any fatal incidents that have occurred in the year.

## INTRODUCTION

A number of UK incidents that resulted in firefighter fatalities at fires - fourteen in the last ten years (2004 to 2013) - are analysed in the report from a risk reduction and risk management perspective. In England alone between 1993/94 and 2003/04, there were 6 firefighter deaths at fires: in the next ten years 2004/05 to 2013/14 this doubled with 13 firefighter deaths and one fire technician death (DCLG FoI disclosure May 2014). The fires happened at different times, in different countries and in different brigades. The fires began at a range of sites including industrial, commercial and domestic premises, some quite large and some small. Sometimes members of the public were at risk and sometimes they were absent from the fireground. The causes of the fatalities have been analysed drawing on available but often patchy and at times conflicting information. Circumstances normally varied from incident to incident. Nevertheless, what emerges for these incidents is that there have often been common or similar causes for several of the fatalities. Those causes, and the means to prevent them or reduce the risks associated with them in the future, have been identified in a number of sources examined including public and legal reports.

Experienced fire analysts were clear throughout this period that safe operational work systems and trained fire fighters and incident commanders familiar with a range of perspectives across many operational issues were vital to fire fighter safety. They were equally clear about where responsibility ultimately lay.

“It is not acceptable for fire departments to risk the lives of their members because they are not adequately trained or equipped or because they do not apply appropriate judgement in conducting emergency operations”. Grimwood 2008: 4

The key facts relating to the fatalities at fires are rarely contested. The same underpinning or root explanations for the fatalities constantly recur and relate not to individuals but to factors external to firefighters at the scene - national and brigade procedures, policies, staffing, training, management and equipment. All reveal that the defences in depth failed. Action is needed by central and local government including ministers and civil servants at the DCLG and similar government departments in other countries within the UK, LGA England and similar UK bodies, CFA, CRFA, brigade FRSSs, the HSE, the police and lawyers to ensure the findings from such fatal incidents are rapidly and effectively applied so that fatalities, injuries and near misses are prevented in the future.

In 2008, the FBU and LRD produced a report with a series of recommendations for action that covered all firefighter fatalities at work not just those at fires. Most of the recommendations are directly relevant to firefighter deaths at fires post-2008 and almost none in 2014 have been fully acted upon. It is tragic and unacceptable that this is the case.



LRD recommendations at governmental level included a call for cross-UK fire and rescue service policy, equipment improvements, reviews of existing reporting procedures with reports on all firefighter fatalities, near misses and serious injuries across UK to be published in one place annually. An independent Fire and Rescue Service (FRS) investigation unit was to be established to examine such events and disseminate advice.

There were also calls for government to ensure guidance on issues relating to recent fatalities. These included the need for minimum attendance standards, revised generic risk assessments, minimum regular operational training standards, minimum Breathing Apparatus (BA) procedure standards, minimum Incident Command and Control system standards, updating generic risk assessments (GRAs) and dynamic risk assessment (DRA) policies and training, specialist training in all aspects of compartment fires and ventilation of high risk buildings as well as standard operating procedures for firefighters in high rise residential buildings along with guidance on heat stress minimum standards for backdraught and flashover training. Some technical equipment actions were also flagged for government and some but not all of these have been acted upon.

Operational firefighters were to carry out regular inspections of all high risk buildings. FRSs should ensure suitable equipment for firefighters including appropriate fireground communications equipment. FRSs should negotiate protocols to protect FBU safety representatives with regard to information, disclosure, access to documents and right to have private discussions with employees.

Unravelling the link between funding, staffing, fire incidents, risks and firefighter fatalities is highly complex. The starting point should be how to prevent both fatalities and fires and then to ask what resources, staffing, technology, procedures and policies are needed to achieve that. This is a cost effective approach too if the human and economic costs of fire fatalities and injuries are properly assessed and not externalised by government and employers to victims, their families, their communities and the NHS. There is currently a danger that the opposite approach may apply linked to some flawed logic. The argument put is that as fire incidents have fallen, fire services can be cut without either public safety or occupational health and safety being jeopardised. One assumes this will be done until the incidents begin to rise again and then a lag will occur before problems can once more be addressed effectively.

Further problems may exist with regard to technology and equipment because as PPE, BA and protective equipment improve, firefighters may be able put themselves in more hazardous situations or go deeper into fires than they would have done in the 1980s and 1990s and hence perhaps increase their risks in some situations. There is also a counter-intuitive element: with the reductions in fires, firefighters experience fewer fires in certain settings and the importance of premises inspection and realistic training for instance in compartment fires and in conditions likely to be encountered in high rise buildings is increased.



Bodies like the NAO do not usually address the question of firefighter fatalities. However, with regard to firefighter fatalities at fires since 2008, the recent incidents make a powerful case for maintaining if not improving staffing and resources and improved risk assessment and management. It may also be significant that several of the recent fatalities happened in small businesses where there were small numbers of employees: such SMEs are a prime target for government's deregulatory and soft touch regulatory policies.

It is a moot point how applications of simple 'business cases' necessarily benefit either public safety or worker safety.

With regard to firefighter fatalities, what is needed are effective solutions not 'innovative' ones linked to business cases. Knight in England makes just one explicit mention of the HSE and worker safety in the whole of his report and none to firefighter deaths. This reveals how a focus on 'efficiencies' cannot simply skew priorities but lead to their exclusion in any debate about services and their purpose.

## **AIMS and OBJECTIVES OF THE REPORT**

The two key aims were (1) to examine recent firefighter fatalities at fires in a variety of settings - industrial, commercial and domestic, and (2) to explore if any generalizable conclusions could be drawn with regard to the findings from the literature and cases explored. The key objective is to formulate recommendations to governmental, regulatory, managerial bodies and others to reduce the number of such fatalities and related injuries in the future. The report therefore examined issues such as risk assessment, command and control, communication issues, standard operating procedures, BA, training, response times, speed and weight of attack.

It identifies any repeated and recurring failures in safe systems of work. It looks at some of the links between firefighter safety and public safety as well as assessing any links between fire service cuts, changes in management approaches and the potential risk of fatalities and related serious injuries in the future. The report draws out common factors, trends, obstacles to change and solutions relating to the incidents analyses. It does not repeat an in depth examination of the incidents already made available in a range of technical, legal and professional publications. Such publications for all the incidents discussed in this report, however, are surprisingly very patchy indeed.

## HOW THE REPORT HAS BEEN COMPILED

A rapid review was done for the scientific, governmental and local authority literature available in the UK and beyond on the subject and supplemented by analyses of a variety of detailed reports on the specific UK cases already identified. These included serious accident investigation reports by fire and rescue services, CLG, HSE, FBU and independent advisors, coroners' inquest and legal case reports, and government and fire and rescue service guidance.

Few research papers on UK firefighter at fire fatalities exist although the literature available on the web is much larger as is the literature on related risks, risk assessment and risk management and the international literature on firefighter fatalities. Interviews were then conducted with long serving current and past firefighters in the FBU who had been involved in investigating the fatalities over the last ten or more year. This allowed a more in depth exploration of views about the causes of the fatalities. The firefighters came from England, Scotland and Northern Ireland. Questions about both general causes of firefighter fatalities and specific incidents were asked. Extracts from the eight firefighters interviewed are included in the report. Additional information was also sought from the HSE and the CFRA's office. None was provided by the CFRA office.

## FIREFIGHTER FATALITIES AT FIRES AND RELATED INJURY AND NEAR MISS STATISTICS

Between 2005/06 to 2009/10, according to HSE figures, the Fire and Rescue Service's injury and ill health rates were above average. According to DCLG figures, in England alone between 1993/94 and 2003/04, there were 6 firefighter deaths at fires: in the next ten years 2004/5 to 2013/2014 this more than doubled with 14 UK firefighter deaths one each in Scotland and Wales - and one fire technician death (DCLG FoI disclosure May 2014). HSE considered there was scope for improvement through better management of health and safety as part of good management practice generally. However, the HSE figures are not broken down into causes of fatalities and injuries. Such information may exist within HSE but it is not currently in the public domain. Details are not provided on major injuries or near misses at fires - an important area to address that should inform developments of effective preventive actions. Individual FRSs may have good data on all these categories but as no consolidated report is provided GB-wide on this, their value is currently lost. It is not clear about the extent to which HSE relies on or uses DCLG data but the latter does not appear to be presented in the same way as the former. Nevertheless the figures as they stand reveal serious health and safety problems. Major injury data indicate the potential for fatalities along with near miss figures but these are not provided.

Table. All firefighter deaths and major and over three day injuries between 2005 and 2010

Employees	2005/06	2006/07	2007/08	2008/09	2009/10p	Total
Fatal	0	2	5	0	1	8
Major	102	123	120	98	96	539
Over 3 day	1202	1087	992	958	539	4778
Total	1304	1212	1117	1056	636	5325

(Source: <http://www.hse.gov.uk/services/fire/statistics.htm>. Accessed October 29 2013)

The HSE issued only 3 notices following the investigation of fatalities to fire fighters in the period 2002/03-2012/13. This indicates that one part of the state system for protecting firefighters at work is at best feeble in practice and at worst broken especially in the light of “official recognition of major under-reporting within the UK of injuries at work”.

HSE has also not issued any enforcement notices following the investigation of reported major injuries to fire fighters in the same period. Inspections of fire service workplaces undertaken by HSE between 2011/12 and 2012/13 have numbered 3 in 2011/12 and 4 in 2012/2013. Yet its own consolidated report in 2010 on 8 fire services noted “there were several occasions where inspectors discovered failings that were serious enough to warrant consideration of enforcement action”.

The RIDDOR (The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995) statistics for including all reported injuries/rates for fire service officers for the period 2004/05 - 2012/13 are as follows.

Severity	Year								
	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13p
Fatal injuries	5	-	-	5	-	1	2	1	-
Major injuries	129	111	133	127	108	106	112	75	171
Over-3-day injuries	1390	1234	1122	1031	995	860	814	649	-
Over-7-day injuries	-	-	-	-	-	-	-	-	553
Fatal and major injury rate <sup>2</sup>	250.7	226.2	259.2	260.4	195.1	201.1	227.8	144.5	329.2
Over-3-day injury rate <sup>2</sup>	2600.8	2514.4	2186.7	2034.2	1797.8	1616.4	1626.6	1234.3	-
Over-7-day injury rate <sup>2</sup>	-	-	-	-	-	-	-	-	1064.6
p = provisional									
<sup>1</sup> Identified by Standard Occupational Classification 2010 (Code 3313 fire service officers)									
<sup>2</sup> Rates are calculated per 100 000 workers									

(Source: HSE: FOI request - 2013110278 - Fire Fighter Fatalities 27th January 2014. Rates are per 100,000 workers)

The fatality and major injury figures indicate this sector again merits serious HSE surveillance. The DCLG figures for GB non-fatal injuries appear to indicate an improving picture in terms of recorded numbers and provide data about injuries in each brigade. It may well be that DCLG and Brigades do have these break downs but they do not appear to be publicly available in a user-friendly form. No rates are provided nor are there details on how many fires firefighters attended incidents, the nature of those fires and the time spent on the fireground or other details of the incidents attended that would inform risk assessment and risk management decisions. These data are therefore far less valuable than those available for the USA.

**Table 9: Non-fatal firefighter casualties from fires by nature of injury<sup>1</sup>, Great Britain, 2000/01 - 2011/12**

Year	Total	Nature of injury <sup>1</sup>							Precautionary check-up and first aid
		Burns	Overcome by gas or smoke	Burns and overcome by gas or smoke	Physical injuries	Shock only <sup>2</sup>	Other	Unspecified	
2000/01	622	65	26	0	236	0	119	8	168
2001/02	686	67	35	1	271	2	53	0	257
2002/03	508	59	33	1	282	2	30	1	100
2003/04	435	67	19	1	235	3	45	2	63
2004/05	355	64	10	1	221	1	16	2	40
2005/06	334	50	15	1	182	3	19	1	63
2006/07	306	33	21	1	175	1	13	1	61
2007/08	252	43	12	0	106	1	15	0	75
2008/09	285	36	10	0	111	1	11	0	116
2009/10 <sup>3</sup>	-	-	-	-	-	-	-	-	-
2010/11	189	13	9	0	56	2	15	0	94
2011/12	233	8	12	1	45	2	19	0	146

<sup>1</sup> Table shows main injury only, priority being given to 'burns' and being 'overcome by gas or smoke'. However, if both these injuries occur, this is shown separately.

<sup>2</sup> includes anaphylactic shock also

<sup>3</sup> 2009/10 figure was not shown due to incomplete record from one Fire and Rescue Authority

[Source; DCLG/ONS. Fire Statistics: GB 2011 to 2102. Time Series Tables]

In Scotland and Northern Ireland, similar but apparently not identical figures from the Scottish Government have been collected and made available on non-fatal casualties from primary fires for FRS personnel. The Scottish table below illustrates the range of these data.

	2008/9	2009/10	2010/2011	2011/12
Precautionary check recommended		2	3	3
First aid given at scene		4	3	9
Person went to hospital, injuries appear to be slight		9	18	12
Person going to hospital, injuries appear to be serious		2	3	4
Total		17	27	28

(Source: extracted from FIRE STATISTICS SCOTLAND p47 2011/12 Table 12d.

<http://www.scotland.gov.uk/Resource/0040/00403593.pdf>; Table 9d p33 2010/11

<http://www.scotland.gov.uk/Resource/Doc/361231/0122132.pdf>; Table 9b. p30

<http://www.scotland.gov.uk/Resource/Doc/933/0118382>

## UK FIREFIGHTER DEATHS AT FIRES: INCIDENTS between 2004 and 2013

The following incidents in England, Northern Ireland, Scotland and Wales involving firefighter fatalities at fires are listed in chronological order. A synopsis of each incident is provided with a view to examining key factors and identifying common themes. Detailed and sometimes very detailed reports on the various incidents have been produced by for example the fire services themselves, technical specialists, the FBU, the HSE and the courts.

Where these reports are publicly available, they have been cited in the specific incident summaries provided below. The causes of the fires were not always identified and at least one and possibly three involved arson. The properties involved also varied ranging from domestic houses to shops, bars, hotels, warehouses, small industrial units and blocks of flats. All show sometimes significant similarities as well as differences between fires. They help to reveal what if any actions were taken to avoid similar events in the future and how successful those actions were. Each account is presented at this stage in a simple form with pre-fire, fire and post-fire sections.

One firefighter death occurred in Wales in May 2004, that of Richard Jenkins, due to an explosion of a gas cylinder out of sight in an attic following an arson attack in a bingo hall. This is not discussed in detail in this report as the circumstances were clear. The two men responsible for the arson were found guilty and imprisoned for ten years each.

**BETHNAL GREEN 20/07/2004.** 419 Bethnal Green Road, London. Firefighter fatalities - Bill Faust and Adam Meere. London Fire Brigade (LFB).

A three story building was involved – basement, ground floor clothes shop, two floors of residential flats. Detailed structural plans of the building were not known to the London Fire Brigade. The fire had many similarities with the Gillender Street fire in London in 1991. Fifty firefighters and eight appliances in total were eventually at the scene. At 04.38 four appliances were ordered to attend. One hour and seven minutes later, make pumps six was called. Two crews with BA were committed and a BAECO was appointed. Heavy smoke came from a ground floor door. A third and fourth relief crew, the recommitted first crew, were committed to fighting the fire. Faust and Meere were the fifth crew and BA wearers but without communications. A sixth and seventh crew were committed. Rumbles and flames were heard in the building. The seventh crew could not reach the sixth crew. An eighth and ninth crew were committed. The first floor was alight. The time of whistle was near for the fifth crew. An ADSU was heard and crew seven found the first firefighter casualty. Crews eight and nine removed the first firefighter casualty from the building. An eleventh crew found the second firefighter casualty who was later removed from the building.

Two residents had to be rescued from a flat roof. There were heat and smoke problems. Ventilation of building through windows and doors fire by a sixth crew at the rear of the building led to increase in fire intensity. Like other incidents, locating and fighting the fire took a considerable time.

The FBU's own report on the incident identified a range of factors, latent and active, that led to the two fatalities. The 'latent' or institutional environmental factors covered the risk management and risk assessment approaches that flowed from brigade policies and practices and related training, experience, information, equipment and other elements. The FBU had concerns that the brigade response to various HSE improvement notices issued prior to 2004 had often been lengthy and sometimes not fully implemented. Many of these problems have still not been effectively addressed and re-emerged with later fatalities. Additional problems were identified with plans, the command structure, the low numbers of experienced senior officers at the fireground, and the nature of appointments based on evidence of effective decision making on the incident ground. ICs need dedicated officers to support her/him with regard to gathering and processing. Sector commanders need role training.

On personnel issues, the FBU recommended increasing the minimum size of an appliance crew to five including a minimum of one Watch Commander and one Crew Commander and that a minimum attendance to all basement fires should be six pumps. Appliance crew numbers in 2012 in parts of Denmark, France and the Netherlands all exceeded five (Scandella 2012). Threats now exist in 2014 to crew numbers - signs of failing to learn the lessons of such fires as that at Bethnal Green - stations and general staffing in London.

There are also currently major concerns about planning and the IRMP including risk planning processes. The Rule 43 letter produced by the coroner in 2013, following the Lakanal House fire of 2009 in a high rise building, where there were resident fatalities but no firefighter fatalities, raises some general points about the LFB approach post-Bethnal Green that still required action. It begs the question as to why measures advocated after Harrow Court 2005 and Shirley Towers 2010 were still not apparently being adopted in London in 2013/2014. The deficiencies identified by the coroner included the recurring topics of the brigade's risk assessments of sites, familiarisation visits, and communication issues.

London Fire Brigade's 5<sup>th</sup> Safety Plan for 2013-2016 was drawn up in 2013 and contains the IRMP. It has high level commitment to the health and safety of its staff and also includes some general strategic objectives on health and safety linked to reducing RIDDOR accidents. The impacts of proposed cuts in fire stations, engines, numbers of pumps, crew numbers on fire rescue appliances on firefighter health and safety cannot currently be measured.

**HARROW COURT, HERTS 02/02/2005.** 85 Harrow Court, Silam Road, Stevenage, Hertfordshire. Firefighter fatalities - Jeffery Wornham and Michael Miller. Hertfordshire Fire and Rescue Service (HeFRS).

The fire fighter risks presented by high rise buildings in the UK had been recognised for some considerable time with deaths, injuries and near misses occurring in the 1980s, 1990s and early 2000s (Grimwood 2005:4-5). These events led to the ODPM commissioning research on high rise fires and in 2003 revising its guidance on these buildings and the policy was developed through liaison between CFA, FBU, HMFSI and others. Such a collaborative approach seems highly unlikely in 2014. Not until 2006 were provisional guidelines circulated updating the GRA for high rises. The eighteen story block of flats was built between 1965 and 1967 with a hundred and three flats. It is not exactly clear what work had been done in the flats relating to smoke alarms installation and checks and adoption of BS 5839: 2002 on not using plastic trunking to secure fire alarm cables. Pre-paid electricity meters also meant that there was no electricity in the flat to power the smoke alarm. The dry riser for the flat had been secured by a chain because it had been vandalised. No bolt cutters were immediately available to cut the chain. Shirley Towers in 2010 had similar circumstances.

Firefighters in 2005 were unfamiliar with the premises and the likely risk they would encounter in an emergency, as they no longer carried out inspections on these types of premises. Training inadequacies existed for firefighters and supervisory officers including BA training, emergency response training and Dynamic Risk Assessments (DRAs) as well as high rise incident training. The fire involved a person-reported call and two pumps were initially in attendance. There was no effective BAEC and the two firefighters entered the flat without water and prior to a bridgehead being established.



Nine firefighters were present at this stage. One firefighter became entangled in plastic fire alarm cables which fell from overhead plastic trunking: a major factor in his death. Another firefighter and a resident died within the flat.

The coroner's inquest report included a Rule 43 letter. The recommendations related to procedures for tackling high rise fires linked to familiarisation, information and training, safety features of high rise buildings, general training, personal protective equipment especially ADSUs and their battery operations above 55 degrees Celsius, water supplies and equipment. It specifically recommended all fixing/supports for fire alarm systems to be non-combustible/fire-resisting but not for other cables. DCLG the changed building regulations Building Regulations and in Approved Document B, restated the guidance for fire detection and fire alarm systems for buildings (BS 5839-1 2002) where cable support for cables used in fire alarm systems should generally be non-combustible. BS 5839-1: 2002 and A2:2008 (Paragraph 26) followed with three clauses relating to fire alarm cabling. Herts FRS prepared detailed reports on the fire including these cabling issues.

The Herts FBU incident investigation made seventy three recommendations. They identified serious organisational weaknesses in the identification, assessment and inspection of actual high rise risks and checks on SOPs relating to high rise risks. They further found insufficient provision of emergency response resources to form the initial attendance for compartment fires in High Rise risks such as Harrow Court". Herts FRS produced a report on the incident and also made four very specific recommendations, including many to the coroner, on reviewing safe systems of work, supervision and command, equipment and PPE, communications strategies, matters relating to the buildings, inspections and specific operational procedure changes and training actions including BA training and realistic training scenarios. By 2010, several service recommendations relating to procedures, audits and training had been implemented according to the FRSs self-assessment and a group headed by Sir Ken Knight and including CFRAU, CFOA and CLG was reviewing national progress on the Rule 43 letter. Debate continues about the speed and extent to which FRSs act on information relating to fire fighter fatalities. Some chief officers in other brigades apparently did move quickly on incidents such as Shirley Towers in 210 and Harrow Court yet it remains difficult to track and independently validate changes following incident recommendations.

In 2013, the coroner's rule 43 letter to the LFB on the Lakanal House deaths revealed that the lessons learnt from Harrow Court and Shirley Towers on risk assessments, familiarisation visits, bridgeheads and communication had either still not been accepted or not implemented fully elsewhere in the UK. The Herts FRS IRMP for 2014-2018 does briefly - in two short references in a ninety five page document - acknowledge firefighter safety as one of the primary risks for the service to consider but lacks data on fire fighter injuries and health and safety matters. It is therefore of concern that in 2013, firefighter safety appeared to be at the very margins of the Herts IRMP.



**MARLIE FARM, EAST SUSSEX 03/12/ 2006.** Festive Fireworks Ltd, Marlie Farm, Ringmer, East Sussex. Firefighter fatalities - Geoffrey Wicker and Brian Wembridge (video technician). Nine other people were injured in the incident. East Sussex Fire and later Rescue Service (ESF[R] S) was involved.

The site contained a dwelling house, a storage and retail sales office and retail shop for fireworks licensed by East Sussex County Council Trading Standards, and an area licensed by HSE for storing and preparing fireworks. The fire apparently started with igniters on a veranda and then spread to a van. Explosions occurred before the emergency services arrived. Two pumps were initially mobilised. Additional pumps and appliances were then called. An ISO container was cooled. Water supply problems occurred. As the public were present on scene, the IC requested police to evacuate them but they did not go. So the IC adopted an offensive tactical mode.

The Level 2 incident commander asked for police to instigate a six hundred meter cordon but the police reported they had insufficient resources and so they could not do so. A decision was taken to evacuate the site. The Evac whistle sounded and apparently a fireground message to evacuate was sent. Yet sector 4 crews were seemingly unaware of the evac signal and continued working. The shipping container then exploded killing Wicker and Wembridge and injuring nine other ESF[R]S personnel, two police officers and two members of the public. A defensive tactical mode was then adopted at the scene.

In 1998, in Australia, eight ISO containers of fireworks exploded. In the Netherlands in 2000 a fireworks storage complex exploded and killed twenty two people. In Perth, Australia, in 2002 an ISO container of fireworks exploded. In Europe, this led to collaborations between several health and safety agencies including the UK Health and Safety Laboratory (HSL). They looked at experimental explosions of ISO containers filled with fireworks - the CHAF project of 2003.

There is no evidence that the HSL or HSE positively promulgated the experiment results they obtained. However, the information would have been available to any who searched for it. The Manufacture and Storage of Explosives Regulations (MSER) 2005 and related Code of Practice (COP) guidance states: - "Fire Services may wish to consider in advance in what circumstances they would or would not fight a fire. Firefighting action should generally be limited to preventing the fire spreading to buildings or areas containing explosives, or to fighting secondary fires after an explosion. In general the fire services should withdraw to a safe distance if the fire should spread to a building known to contain explosives or other similarly hazardous materials. If there is any doubt about the nature or location of the explosives involved, the fire should not be fought and the fire service should withdraw to a safe distance".

There is no evidence that the Code of Practice was ever disseminated within the ESF[R]S, nor fully considered by those centrally responsible for safety policy and ESFRS inspections conducted of the Marlie Farm site under the GRA. It was left to station managers to decide what familiarisation visits should be made to sites of interest in their areas. Station managers were never told by ESFRS centrally to focus on places where explosives were held.

The Brigade had not identified all the premises in their area where fireworks were manufactured and stored and apparently no-one had been tasked to contact the HSE to see where the relevant licences had been granted. No ESFRS plan had been drawn up for firefighting at Marlie Farm, though it was licensed to store more than 2000 kilograms of explosives. In the court case, the judge decided that 'there was a failure to ensure that Marlie Farm was not only properly inspected, but that a 7(2)(d) card prepared and made available for firefighters attended the scene. I have indicated above what information would have been made available by such means'. The FOA Branch noted concerns in 2010 about current economic pressures and funding pressures that might impact adversely after the Marlie Farm Incident.

In 2013, ESFRS stated its IRMP was "part of the CLG's long-term agenda to modernise the fire service and to improve standards of service delivery at a local level. Through a dynamic and holistic approach to risk assessment we will deliver a Fire Service focused on the changing needs of our communities with increased emphasis on prevention and community safety. ....The Fire Authority is seeking to deliver continuous improvement in the services it provides and we will achieve this by investing in our employees, forging strong relationships with a range of partners and valuing diversity" (ESFRS IRMP web page. October updated 2013). These statements are strong on rhetoric but very hard to substantiate easily. It is difficult to identify in such high level statements how exactly the service protects its firefighters or any high level commitment to firefighter health and safety. This may be covered in more detailed lower level operational information but is not transparent and evidence-based here. There are for example no mentions of firefighter safety in ESFRS IRMP scoping statements on fire cover and resilience in non-urban area for 2009/10-2011/13.

The FBU in the brigade area found no significant improvement in the brigade's occupational health and safety performance.

The East Sussex Fire Authority (no longer called the ESFRS) in the civil case argued there had been no failures in pre-planning including inspection and training, no incident command and control failures and that one of the fatalities was due to contributory negligence. These defences were rejected by the judge as was their third defence which has relevance beyond the ESFA.

The nub of the third defence was that health and safety law designed to protect employees did not apply to FRSs because there was 'fire service immunity' on the fireground. In November 2008, HSE indicated they were happy with the progress ESFRS was making on health and safety particularly through the core briefing system and the tactical decision-making process. The 2008 assessment sits rather oddly with a HSE letter in 2010 indicating satisfaction with the ESFRS's corporate approach after apparently having flagged concerns about risk information gathering, monitoring and sharing and some issues still with the core brief system as well as some points about training. In July 2014 the legal case to determine who was responsible for the deaths of the two fire fighters, and hence compensation, was still delayed in the Court of Appeal - some eight years after the fatalities occurred (Vowles 2014). Not until Christmas 2014 did the East Sussex Fire Authority concede that it would no longer appeal against the 2013 High Court judgement ordering pay-outs to the families of the dead and injured firefighters.

**ATHERSTONE, WARWICKSHIRE 02/11/2007.** Weal moor Atherstone Ltd, Hangers 1 and 2, Atherstone Industrial Estate Atherstone-on-Stour. Firefighter fatalities - Ian Reid, John Averis, Ashley Stephens and Darren Yates-Badley. Warwickshire Fire and Rescue Service (WFRS) and other neighbouring brigades.

The property had ground and first floors of sandwich panel construction and it was used as a vegetable packing warehouse with ninety five production staff and forty office staff. Property fires within WFRS area have a pre-determined attendance (PDA) of two pumping appliances unless previously identified as a special risk or persons reported this has neither so two pumping appliances were mobilised. The local council knew building work at the warehouse was underway but did not liaise with the FRS. Building Regulations required that the owner's full plans on extension should have been sent to the local council and then in turn to FRS but they never were. No fire suppression system was fitted. This might have dealt with the fire automatically. Apparently no fire assessment of the premises was done in 2007. The tactical plan at the time was apparently indirectly based on the assumption that fire resisting walls and doors were where they should be. A missing set of fire doors results in a wall with no fire resistance. This added an extra and unexpected burden onto firefighting operations. Some doors failed to operate and there were gaps around fire doors. Building work was incomplete because of the insolvency of the Bomfords' company. The fire loading in the storage/packaging area was far greater than a single pallet. The pallet on fire was one of twenty two pallets located to the rear of the storage/packaging area containing labels, cartons, and punnets and wrapping film. The area also contained property cleaning materials, furniture and old computers. This information was not available to the firefighters who attended the fire.

WFRS had no policy/procedure for designating retained appliance crewing when responding to alerts with regards to BA wearers. Risk assessment factors to be considered would include the potential for a fire occurring; the intensity of the fire; the stability of the building; the potential for fire-fighters to become disorientated whilst fire-fighting; the risk of external spread; the potential environmental impact; the potential impact on the community". The Atherstone fire appeared to present no major environmental threat although a significant number of local jobs might be lost.

An analysis of the incident focussed on 'systems' failures (FBU 2014a) and found at the time of the incident WFRS relied on building control to consult with them about fire safety matters. "WFRS had a policy for the passage of information from building control to the Service Fire Safety Department and this should have triggered the premises risk assessment process". According to the FBU, Section 2 of the GRA guide gave specific warnings and had a direct bearing on the Atherstone fire as it dealt with complex modified buildings with complex access arrangements and unusual patterns of fire spread and behaviour.

The 2000 CFOA report on fires in large volume buildings flagged key threats including buildings remote from fire stations where, by the time fire engines arrive, the building could be full of smoke with the fire already well developed. Internal size and layout could limit firefighters' ability to fight the fire and severely limit their ability to search the building effectively whilst locating the seat of the fire maybe impossible. There could be a risk of early collapse of racking and/or the structure as well as a risk of unseen fire spread at high level and due to the fire loading the flame front may accelerate very rapidly. The conclusion was that unless the role of all parties in ensuring the safety of employees and firefighters alike was made clear and the fact that traditional firefighting tactics was not always possible, fire authorities and individual fire officers would remain vulnerable.

Strategic and brigade policies and procedures and training and information were significant factors in influencing how the fire was fought and events raised large questions about their adequacy. Sandwich board use in building construction was again highlighted as a major hazard as were falling plastic cables from the lighting system. Problems with provision and effectiveness of radio equipment for firefighters were identified. Questions were raised about the absence of written risk assessments, the command, control and BAECO procedures and resources, use of and defects and limitations with the radios.

HSE issued an Improvement Notice in 2008 served on Warwickshire FRS. This included reference to an action plan identifying a list of new and existing premises, likely to pose risks to firefighters during operational incidents, about which WFRS did not currently have operational premises risk information, upon which to make a suitable and sufficient assessment of what preventative and protective measures may be required.

HSE commented: "HSE has formed the opinion, based on the evidence we have seen, that the current arrangements employed by the authority do not comply with the statutory duties to provide its firefighters with all the information they should have to assist them in making the appropriate decisions when attending a fire," according to Alan Craddock, Head of Operations for HSE in the Midlands (Guardian 16 January 2008). He added: "We are not happy with current wider arrangements on their provision of information given to crews attending fires at certain premises and the fire service should create an action plan for the inspection of premises which gives priority to higher risk buildings".

The WFRS response included an internal investigation, service improvements linked to policy and planning, BRE fire testing and staff changes and shared learning. The planning authority had major questions to answer in terms of a lack of planning approval for the £6 million extension, lack of checks by the planning authority of the building, a sprinkler system in the extension not linked to a water supply, fire doors not installed, and the first-floor extension with no external fire exits usable by firefighters.

Atherstone revealed a catalogue of 'organisational systematic failings' and the FBU challenged the judge's view that dynamic risk assessment was 'common sense'. The WFRS protested that the police seized service reports before they could be considered: the reports contained critical information that WFRS viewed as "vital" to firefighters' safety nationwide, but the fire service was denied access to the reports until May 2011 (Howard Fidderman. HSIB 1 September 2012). The FBU further flagged the problems with the FRS report, co-ordination between emergency services and a lack of a protocol to ensure collaboration. Recent publications may have addressed this on paper but again hard evidence to support that conclusion is lacking. The FBU also flagged potential conflicts of interest with lawyers representing both FBU members and the families of those injured or killed, the possible need for independent legal advice for the union, the role conflict between liaising with parties to support them and investigating the incident and the need for safety representative training on incidents. The latter may have been addressed by the TUC/FBU pilot course on serious accident investigation in 2012.

The WFRS IRMP for 2013-2017 (nd) noted there had been no fire-related deaths in domestic premises since January 2011. Its report also specifically referred to ideas to "to further protect the public and keep our firefighters safe" (p4) including the need to examine risk from both the public's and firefighters' perspectives. Additional reference is made to new protective clothing for firefighters and the need for ICs to have the correct numbers of trained firefighters with the right vehicles and specialist equipment to deal with different types of incidents. This IRMP is unusual in that it includes keeping firefighters safe, a table of priorities and a focus on firefighter safety at this level.

**BALMORAL BAR, DALRY RD, EDINBURGH 12/07/2009** - Firefighter fatality – Ewan Williamson. Lothian and Borders FRS (LBFRS).

Some aspects of fire safety, although not the HSE enforcement of health and safety laws relating to firefighters, have been devolved. The service has also recently – 1<sup>st</sup> April 2013 - been consolidated into one nation-wide body in Scotland. A legal case relating to this fatality is currently in the Scottish courts involving the body that succeeded LBFRS, the Scottish Fire and Rescue Service (SFRS) and so the information provided here relates only to that which is in the public domain.

The Balmoral Bar was part of a tenement with a basement, ground floor and then 3 floors of residential flats. The bar had two emergency exits, one at the rear and one at the top of the stairs to the basement. The bar was reported on fire at 00.38. Three pumps and turntable ladder were mobilised with sixteen firefighters. Firefighter Williamson was in BA in the bar and became trapped. The ground floor collapsed and firefighter Williamson was found dead in the building.

In 2005/6 the advisory structures such as the Central Fire Brigades Advisory Council (CFBAC) and its Scottish equivalent (SFBAC) were removed and the inspection regime operated by HMIs was changed to one advising the minister rather than inspecting policies, procedures and compliance. Hence self or peer assessment became the norm. Both the advisory councils ensured that consensually agreed procedures and standards were promulgated to the service. Good practice had occurred under the 1947 Act and some firefighters considered it was lost in Scotland when the Fire Services Act was implemented in 2006.

LBFRS Service Improvement Plan 2005-2010 [extract from pages 15 & 18] Structural firefighting stated: “We respond to any call to a fire in a building or any other land-based structure. We will respond immediately to any request for assistance. We will attend any call to a fire within a building or any other land-based structure within a time consistent with our existing targets. We will mobilise a fully capable team to each incident. ....We intend to provide a response to structural fires with time targets which are consistent with the existing first response times. Subsequently, any variations will be based on an evidence-based argument. Our definition of a ‘fully capable team’ will depend on the type of incident we are attending”.

The Communities and Local Government (CLG) Report notes on the following on Core Temperature, Recovery and Re-deployment during a Firefighting, Search and Rescue Scenario, Fire Research Technical Report 18/2008 (Appendix 14).



**Executive summary – Recommendation (2)** ‘For firefighting, search and rescue activities conducted under conditions of live fire and continued to the operation of the low cylinder pressure warning whistle, the average firefighter should have at least 50 minutes of recovery, ideally, but not necessarily in a cool environment, with their PPE removed, and to consume a minimum of 1000 ml cold water. This recovery duration should be extended to at least 65 min to protect 95% of firefighters engaged in more typical 20 min deployments.

LBFRS Framework Operational Procedure covered environmental conditions, heat and humidity. It notes that working in hot and humid atmospheres can lead to serious physical effects including rapid fatigue and confusion. In consequence, performance levels deteriorate, decision making and manipulative skills reduce and vision is adversely affected. In order to reduce the risks involved fireground control measures will include: - keeping personnel cool and relaxed prior to deployment; limiting exposure; working at low rates of effort, taking breaks where possible; and drinking water. Fire Service Manual, Volume 4, Fire Service. Training, Guidance and Compliance Framework for Compartment Fire Behaviour Training (CFBT) (Appendix 17) covered similar ground including physiological controls and risk control measures to prevent harm being caused and describes pre-exposure control measures, health monitoring and self-assessment prior to any period of training involving exposure to hot conditions.

Firefighters must be given adequate information and training not just in recognising the symptoms of heat related illness but also in understanding how their susceptibility might vary and the factors that can contribute to that variation. “The Heat is On” document used by a number of brigades provides reminds trainers and students of the various risks and personal factors that may have an impact on their wellbeing.

Four years after the fire, the crown finally brought three charges against SFRS, the successor body to the Lothian and Borders FRS. It includes a claim that there was a failure to prioritise Mr Williamson's rescue. The first allegation claims the necessary "instruction and supervision" was not provided to employees. This includes an accusation that there was a lack of appropriate training for firefighters in relation to tackling basement fires. The second charge states the fire service failed to provide "a system of work" that was safe and without risks. Prosecutors allege there was not an adequate response to Mr Williamson becoming trapped in a toilet on the ground floor at the Balmoral Bar. The indictment details a failure to appropriately "prioritise his rescue" and utilise the relevant equipment to save him. It further claimed there was no proper response to a breathing apparatus emergency situation. The charge also alleges there was a failure to institute an effective communication system between firefighters. The final charge claims there was not a "suitable and sufficient risk assessment". It includes an allegation of not identifying adequate control measures in conditions of "restricted visibility and extreme heat".

The Strathclyde IRMP for 2010-2013 (nd:12) focused on risk critical information as the basis for improving operational tactics and training that 'will contribute to firefighter and public safety' linked to the work of its incident research and investigations section but provides no more detailed insights into how it would ensure firefighter health and safety.

In a review of the implementation and impact of IRMPs in Scottish Fire and Rescue Services for the Scottish Government (nd) by Steve Torrie, the Chief Fire and Rescue Advisor, the importance of risk-based enforcement strategies for improved firefighter safety was very briefly noted and linked to integration of core services. However, the document does not provide information about firefighter injuries whereas several tables cover public injuries and public safety. The Scottish Fire Service Strategic Plan for 2013-2016 (2013:26) does flag firefighter safety and includes a target on reducing firefighter injuries linked to a general statement about training, high quality PPE and specialist equipment.

**SHIRLEY TOWERS, HANTS 06/04/2010.** Flat 72, Shirley Towers, Church Street, Southampton. Firefighter fatalities - Alan Bannon and James Shears, Hampshire Fire and Rescue Service (HFRS).

Shirley Towers is a sixteen story block of hundred and fifty residential flats - each flat covering three floors - made by the REEMA construction process. A fire was reported in Flat 72 and the first appliance attended four minutes after the call. A dynamic risk assessment was conducted on arrival and 6 appliances were called for. BA teams entered the building, one using a TIC and hose line. The team containing the two fire fighters who died had BA, radio and a TIC but no hose. Windows were opened in the flat to aid visibility but then temperatures rose rapidly and to an 'unbearable level'. The two firefighters became entangled in cables that had fallen from walls and ceiling when plastic fixings and ducts melted.

Firefighters had concerns about how the Generic Risk Assessment operated for the high rise in Southampton.

These elements all link in to appropriate resources and their use, training for dealing with fires in high rise buildings and the different risk perceptions that might exist among managers and firefighters about priorities. The importance of central government getting out information as quickly as possible from investigations of previous fatalities at fires in high rise buildings to inform firefighters elsewhere is highlighted by Shirley Towers.



“At the time of Shirley Towers the (D)CLG was supposed to produce some guidance for Harrow Court on what information was required and how it should be organised. But that hadn’t been published so that was stuff that was sat with the (D)CLG that hadn’t been completed at the time and that was completed April 2012 I think just before the Shirley Towers enquiry”. ff8.

The Coroner’s inquest included a Rule 43 letter that recommended all cables, and not simply fire alarm cables as referred to in the Harrow Court Coroner’s rule 43 letter, should be supported by fire-resistant cable fixings/containment and the Building Regulations should be amended accordingly as well as BS 7671. This was linked to improvements in BA design and provision of insulated wire cutters and related training developments. The Atherstone fire of 2007 also of course involved problems with cables. Hampshire FRS prepared detailed reports on the cable issues after the fire. Reviews of training on techniques to contain and cool compartment fires were also recommended along with a review of training with regard to tactical ventilation procedures in compartment fires and changes in sprinkler requirements, signage and GRA training.

The coroner further noted guidance and clarification was required with regard to search procedures as set out in Technical Bulletin 1/97 (Breathing Apparatus Command and Control Procedures), to ensure that thermal imaging cameras are used to search for fire in smoky conditions and that firefighters understood the importance of fully extinguishing fires before proceeding past or above the fire scene. In addition methodical search patterns were needed for example area by area, room by room or floor by floor. Search patterns should be standardised across every FRS in the UK so that there was a common understanding and procedure when fire-fighters from different FRSs were engaged in joint working. This is an issue raised in a number of incidents before the Shirley Towers fire for example in Harrow Court in 2005, Atherstone in 2007 in the Balmoral Bar fire in Edinburgh in 2009.

There were several problems with how the FRS, police and HSE dealt with the inquiries into the events in the first two years. Police interviews had to be repeated to comply with PACE and the police again restricted access to information. Insurance company representatives were also reportedly sitting in at investigation meetings. There were also suggestions that the initial HSE report had been modified. FBU continued to have concerns that investigations tended to focus on human error by firefighters at the end of a long chain of decisions and not structural and organisational failures that underpinned and determined how fires were dealt with by firefighters at the fireground.

The HFRS investigation report recommended action on information about scissor designs of flats and related fire control and access points, giving consideration to providing firefighters with a method of identifying ambient working temperatures and reviewing brigade operational training with regard to procedures for dealing with working in excessive temperatures.

Some similar concerns emerged about the latter with the Balmoral Bar fatality. Reviewing the training and guidance given to personnel with regard to the importance of fully extinguishing or controlling fires before proceeding past or above the fire scene was noted. Choosing the most appropriate and methodical search patterns, for example area by area, room by room or floor by floor was also picked out.

The HFRS wished to review its guidance on when and how near miss reports were submitted and ensure all personnel, especially officers in charge, were aware of the importance of submitting these reports which would be comprehensive. Unfortunately it appears the near miss reporting procedure is not being used as comprehensively as it should be, resulting in serious and potentially critical learning points not being reported and therefore not acted upon to reduce the likelihood of a reoccurrence. Despite as many as six personnel 'mentioning' that fallen cables had been an issue for them, only two near miss reports were submitted, and these only after prompts by the FBU.

HFRS in 2011 responded to the ten points raised by HSE which the HSE reviewed and commented upon further. To outsiders, it is surprising that the queries raised by HSE had not already been dealt with in HFRS. With regard to the Shirley Towers fatalities, HSE "reached the conclusion that it was likely that certain parties had breached health and safety legislation, in relation to actions taken, instruction omitted, or through the inadequate provision of safe procedures. However, we also considered whether or not these breaches had significantly contributed to or caused the sad deaths of the firefighters. We concluded on all counts that there were certainly acts and omissions which if carried out differently may have had an effect on how the incident developed, but the evidence did not reveal any single act or omission, or defective or absent procedure, which taken alone could be said to have caused the deaths".

HSE then in 2012, following their earlier 2011 correspondence with the HFRS, made 49 specific recommendations to HFRS on management, policies, procedures and equipment. There was a greater focus on the role of HFRS than is reflected in the HFRSs own incident report. Recommendations covered the need for HFRS to develop contingency plans for a range of reasonably foreseeable events that a firefighter could encounter at high rise buildings, as recommended in GRA 3.2 'High Rise Fire Fighting'. The contingency plans should be proportionate and include flexibility to allow Incident Commanders to adapt to incident circumstances. What is of concern is that GRA3.2 was issued in 2008 and, two years after its issue, it did not appear to be used by HFRS.

A further two years elapsed before HSE made its recommendation to the HFRS. Then HFRS agreed to develop appropriate contingency plans for reasonably foreseeable events. HSE also recommended action on several other points included within GRA3.2 relating to water jets and BA cover, call handling and training. The reasons why HFRS had not incorporated key parts of GRA 3.2 2008 by 2012 are not explained. Such responses emphasize why external inspection and not self-regulation are so critical along with the need for a properly resourced HSE able to act expeditiously rather than producing piecemeal reports and visits that are not implemented fully and quickly by brigades until follow-up visits occur.

HFRS reviewed its operational training including videos, compartment training in high temperatures after the fatalities as well as checking events on the fireground and issuing updated operational bulletins. The city council introduced new signage for high rise buildings and checked cabling. Issues remain for the FBU about BA technology and use.

In 2009, the HSE had carried out sample inspections of HFRS's management of health and safety and recommended the Service should "ensure that their BA refresher training provides a standard at least equivalent to that recommended in Fire and Rescue Service Circulars 18/2009 and 17/70 and should actively monitor the use of the 'rapid deployment' BA start up procedure to ensure correct procedures are being followed".

It further noted "the Project to revise the Dynamic Risk Assessment should link in with national work currently being undertaken in this area. Terminology used should reflect that in the Fire and Rescue Manual on Incident Command". Several of the issues later identified in the HSE's investigation of the Shirley Towers fire in 2010 were not directly picked up in these sample inspections: for example adoption of good practice outlined in GRA 3.2 2008. It would be valuable to hear from HSE as to how it assesses the effectiveness of such inspections and whether it audits them and revises its approach accordingly.

In 2013, the HFRS Service plan for 2013-2016 that covered the IRMP functions was produced and made no specific reference to firefighter health and safety but did make reference to acting on reports such as those from HSE. References to community safety are included. The HFRS Annual report 2011-2012 makes no reference to health and safety of firefighters and provides only aggregate figures for all fatalities and injuries in fires. Within 3 years of the two fatalities at Shirley Towers, it appears from the IRMP that a high level focus on firefighter health and safety has disappeared within the county.

**MANCHESTER, OLDHAM ST 13/07/2013.** Paul's Hair World, Oldham St. Manchester.  
Firefighter fatality – Stephen Hunt. Greater Manchester Fire and Rescue Service (GMFRS).

No information beyond press reports is available for this incident. No HSE, police, brigade or FBU reports are currently in the public domain. The fire, which started in the store room of the shop, was “particularly difficult to tackle due to the complex layout of the building and the amount of materials inside”, a spokeswoman for the fire service said.

Twelve crews and more than sixty firefighters from stations around the county were tackling the fire which broke through to the first floor. The County Fire Officer for GMFRS, Steve McGuirk, said: “Mr Hunt is thought to have been enveloped by some kind of "super heat". He added: "At the minute it's really too early to say what's led to the firefighter's death. It doesn't look like a building collapse or that he fell through any floors. The early indications are an absolutely massive, ferocious and sudden build-up of heat. But where that came from and what caused that we have got absolutely no idea at this stage". [Source: Daily Mirror 14<sup>th</sup> July 2013].

The GMFRS produced a document specifically on Integrated Risk Modelling for 2013/2014 (nd) that looked at community safety and addresses value for money concerns but nowhere explicitly mentions the importance of protecting firefighters and ensuring high standards of occupational health and safety. It should be noted that a firefighter, Paul Metcalf, died in 1999 in the GMFRS area in a non-fire related incident, and questions were then raised about the service's risk assessment of water rescues. The GMFRS Corporate Plan for 2013-2016 that contains its IRMP was produced in June 2013, a month before Stephen Hunt died, and contains just two references to firefighters and nothing explicitly on occupational health and safety in its fifty seven pages.

## **THEMES AND TRENDS THAT EMERGE FROM THE REVIEW OF INCIDENTS**

### **ROLE OF GOVERNMENT – CENTRAL AND LOCAL**

Government ministers may propose legislation to parliament on fire safety and they produce policy on the same subject and provide related budgets to local authority and central bodies. Fires safety matters in 2014 fall under the umbrella of the Communities and Local Government Ministry in England where a junior minister has responsibility for the fire brief. The ministry may also monitor and review fire safety enforcements and the collection of statistics. Scotland, Wales and Northern Ireland may differ. The Office of the Deputy Prime Minister had a key role in the 2000s for overseeing fire health and safety but no longer does. Post-2004, a minister was responsible for producing national frameworks. National Frameworks, discussed later, are written for the FRSs by the Secretary of State under Section 21 of the Fire and Rescue Services Act 2004. National Frameworks 2004-2005, 2005-2006 and 2006-2008 contained guidance on IRMPs and the detail needed in an IRMP.

In 2004 the FBU argued that the 2004 Bethnal Green Rd fire indicated the LFB and authority had failed to fulfil their policies, obligations, statutory requirements and to carry out the advice from the ODPM on several subjects. (Effective inspection and review to check necessary actions were taken was again lacking here). These included ensuring Section 2(2) of the Health and Safety at Work etc Act 1974 to provide “information, instruction, training and supervision” was properly carried out. Regulation 13 of the Management of Health and Safety at Work Regulations 1999 that made a general requirement to provide training when there are new or increased risks and to new recruits was neglected. Other fire service guidance outlined the need to provide realistic training and provisions for attendances on real fire training courses. National Guidance to Principal Officers from ODPM also dealt with the need to provide real fire training, comprehensive knowledge on the behaviour of fires and measuring the outcomes. These points were often not properly addressed. In 2014, firefighters across the UK are still concerned about the patchy nature of training in some parts of the country especially with regard to access to effective hot fire training.

The DCLG works at various levels: technical, policy and increasingly ideological. The technical advice and guidance provided by DCLG has been revised at various times in the 2000s. This material draws on research and evidence and addresses directly and indirectly several of the causes of firefighter fatalities at fires. It is unclear the extent to which the impact of such advice is monitored and audited within the FRSs.

The high level policies of DCLG that relate to the fire service and affect staffing, resources, terms and conditions of firefighters do not look evidence-based. They also need to be set in the context of wider government economic and regulatory priorities. For example, spending on national security in terms of state surveillance and defence spending remains huge for often non-specific, distant and low level threats. Yet spending, where there are specific and immediate threats covering public safety on fire prevention and occupational health and safety including that of firefighters, is being reduced or soon likely to be reduced. Occupational safety and health impact assessments of these changes and proposed changes are missing although regulatory impact assessments have multiplied. CLG guidance initially built on and used earlier guidance from ministries that historically dealt with fire matters and the department now plays a key role in firefighter health and safety with regard to issuing and revising technical guidance and producing broad based policy documents. These are critical influences on firefighter safety at fires.

The DCLG Ministry has not produced visible English-wide guidance on issues thrown up by recent firefighter fatalities or clearly identified research findings covering wide training, operational preparedness and emergency responses. The minister since the 1990s and early 2000s set some store in the Practitioners Forum, discussed later, for addressing other issue but this body is now defunct. There appear to be significant differences developing between England and Scotland with regard to the role of inspections and these may impact on factors that influence firefighter health and safety directly and indirectly.

From the 1990s successive governments, Labour, Conservative and Coalition, have supported policies and deregulatory strategies that have had a considerable impact on how fire brigades function and how their activities are both funded and monitored at national and local level. The UK Government's Business, Innovation and Skills Department (BIS) has direct and indirect influences on fire safety through its better regulation and red tape agendas. The recent BIS review report on the Enforcement of the Regulatory Reform (Fire Safety) Order 2013 illustrates this with its focus on barriers for SMEs and necessary support for and information from fire protection departments. The review found some officers were felt to be "pursuing an unobtainable zero risk; and cumulatively this has a negative impact on the quality of regulatory activity". Nowhere does the review consider firefighter health and safety yet three UK firefighter fatalities at fires have occurred in what might be termed SMEs – the Limavady hotel storeroom in 2003, the Balmoral Bar in Edinburgh in 2009 and Paul's Hairdressers in Manchester in 2013.

The devolution of powers across the UK and the devolution of several key responsibilities from central government to local FRSs also appear to have had an effect on the transparency and nature of oversight of the services with regard to firefighter health and safety. Local autonomy may bring benefits but it also creates many challenges.

Very specific 'national' cuts reduced training and technical support in ways that indirectly were felt to reduce firefighter safety at fires. The commercialisation of the Fire Service College in Gloucestershire is one example. Another would be the effective demise of the Fire Experimental Unit based at the same campus.

The FBU assessment of changes to the current political landscape within which fire and rescue services operate and those firefighter fatalities that occurred after 2002/3 is very pertinent:-

"Prior to 2002/03, fire and rescue services were required to meet national standards of fire cover and crewing. They observed the contents of Fire Service Circulars, Dear Chief Fire Officer Letters (DCOL) and fire service manuals which gave direction on detailed management issues. They were inspected by an external inspectorate of fire and rescue service professionals, who measured against national guidance and performance indicators. From 2002/03 those controls were all but removed (FBU 2014).

## LAWS RELATING TO OR IMPACTING ON THE OCCUPATIONAL HEALTH AND SAFETY OF FIREFIGHTERS

Laws, regulations, codes of practice, guidance and government reports and advice all affect firefighter health and safety, again both directly and indirectly. It has been a dreadful truism that fatalities at fires often triggered positive legal changes but some changes in recent years have often been for the worse according to firefighters.

The Fire Services Act 2004 and guidance issued by the Office of the Deputy Prime Minister (ODPM) required FRSs to plan for, and provide, the required weight and speed of emergency response resources to actual risks that exist in their areas under the Regulatory Reform (Fire Safety) Order 2005 implemented in 2006. This applies to all commercial and multiple-occupancy housing properties in England and Wales. The Order states that the nominated responsible person must carry out a fire safety risk assessment and, if there are more than 5 people employed at the premises, record the findings. These assessments and checks on their enforcement affect firefighter safety. The Order requires any person who exercises some level of control in premises to take reasonable steps to reduce the risk from fire and ensure occupants can safely escape if a fire does occur.

A number of firefighters considered the order had created a weaker structure than existed before.

“I think the Regulatory Reform Orders took some of the influence that the Fire Service had in terms of fire certification away from the Fire Service. I think that was probably a loss because that was a loss in the expertise and also the ability to encounter changes. Somebody had to come to the Fire Service to get a Fire Certificate and had to go and check the building. They would say “oh wait a... minute. Here pass that to the Station. You’d better go and have a look at that, they’ve changed it”. It might have been an OK change but at least they’ve identified it’s a change. Some were sort of mechanisms for passing information and they’ve taken it away now. ff6.

However, the 2004 Fire Services Act was, according to several commentators on the post-2004 fire fatalities, breached by fire services. Section 7 (2)(a), (b) & (d) required brigades to secure the provision of the personnel, services and equipment necessary to respond to fires and to secure adequate provision of training for the personnel involved and to make sufficient arrangements to obtain the information needed to protect life and property in the event of a fire.



The Corporate Manslaughter and Corporate Homicide Act 2007 makes Fire and Rescue Authorities criminally liable for the death of an employee if the way in which they manage or organise themselves amounts to a gross breach of the duty of care owed to employees, and the gross breach causes an employee's death. The Health and Safety at Work etc Act 1974 applies to all employers in relation to health and safety and imposes the general duty on Fire and Rescue Authorities to ensure, so far as is reasonably practical, the health, safety and welfare at work of all of their employees. In 2006, HSE and others produced 'Work-related deaths A protocol for liaison in Scotland'. It was not until 2012 that HSE/CFOA and others produced the Work-related deaths: Investigators' guide for England and Wales.

The very direct impact of deregulatory policies which was in some senses built in to the 2004 Act oddly came after the HSE's 210 report on the group of fire brigades. In 2010 HSE's 'Striking the balance between operational and health and safety duties in the Fire and Rescue Service' appeared. Then in 2012 came the CFOA/LGA Operational Assessment and Fire Peer Challenge Toolkit. The document notes "In the new policy landscape with the abolition of the inspection and regulatory regime and the national performance framework, there is a shift towards local accountability for performance and self-regulation. This fits well with the governance of FRAs, and the sector led approach to improvement".

In 2012, the Fire and Rescue National Framework for England was produced primarily to attack 'Whitehall bureaucracy and red tape' and 'central' controls paradoxically by requiring greater collaboration in a very directed manner from central government and with no reference to the benefits of regulating health and safety. However, more useful GRAs followed on BA, confined spaces and collapsed structures in 2013.

Several firefighters expressed the view that some laws, procedures and policies brought in during the last decade and a half had weakened health and safety for firefighters in ways that may contributed to recent fatalities. Across the UK firefighters have also expressed concern about how risk assessment has been implemented or ignored under the 1999 MHSWRs.

"If you go back previously when they had the Fire Precautions Act 1971 when you used to go and do legislative fire and safety and it was the crews that did it you would have gone into commercial premises with a map to check if they had smoke detectors, fire extinguishers and their exits worked. That was taken away and really replaced by community fire safety. So you would have drawn up to that building and where before you would have done an inspection on the commercial premises. What you are doing now is you are going up and doing home fire safety visits on the domestics and you are not doing the commercial". ff1.



Laws, however, relating to buildings, materials, alarms and smoking bans did contribute to important declines in the number of fires reported. The decline was not just due to fire prevention visits by the fire brigades.

“I think one of the things we need to be very careful of is it’s almost automatic acceptance that the prevention benefits keeping the fire deaths down. I mean there are other factors there as well and things like cigarettes legislation, furniture legislation and how buildings are constructed now and again how that impacts on Fire Brigade behaviour. If you have a fire in a high rise you are talking about confined spaces on a balcony, very little air ingress if you open a front door and then you get beaten back, so it is about understanding all of that”. ff4.

### INTEGRATED RISK MANAGEMENT PLANS (IRMPs)

“I think if you look at the IRMP process which is pretty similar whether it’s Wales, Scotland or Northern Ireland or England it passes the responsibility onto the local authority. Scotland obviously there is some changes now but the, there is no one in England monitoring those IRMPs. The legislation says that your Minister should be satisfied but he’s not measuring anything to see, he waits to see if something goes wrong and then says “well I’d better do something about this”. So he is not going in there and this goes right back to the Labour government that introduced them, you know, and I can remember having a discussion with the Minister and saying “well what are you going to do? How are you going to tell if IRMPs in use?” He said “well it’s not going to be up to us it’s going to be up to local authorities to determine and if something goes wrong they will find themselves in Court”. ff6.

The move away from prescriptive national standards may have given local FRSs a good deal of flexibility to address the risk profiles of their particular geographic areas but it has also meant that the way each FRS addresses high level IRMPs varies and training under the umbrella of national occupational standards may vary too. Several FRSs have lost sight of firefighter health and safety as a priority matter and have become pre-occupied with value for money and retrenchment. There is a strong argument for ministers to require all FRSs to document and audit their commitment to and record on firefighter health and safety in every IRMP they produce. Better standards of firefighter health and safety should also ensure better community safety and best use of resources too.

The problems with IRMPs may vary from country to country within the UK. Some firefighters wanted the IRMPs to be driven by risk management with any discussions about budgets clearly located in the political not the IRMP arena. These decisions may have huge implications for firefighter and public safety for reasons identified in the various fatal incidents.

“One of the reasons why we were so keen to break this link with Integrated Risk Management Plan was whenever you got into budgetary constraints the IRMP changed and to me that was the wrong way round. One was a risk document and the other is a budget process now we all live in the real world and I know there is a link between the two. But if you are saying “here is the risk, here’s what we’ve identified as professionals, here’s what we think you need to reduce that risk. Ah we haven’t got enough money. What do you want us to not provide Mr Politician - over to you”? IRMP was being done where the risk was being manipulated to suit the budget so when the Service came in and said “oh we can’t afford to have all of this. What we’ll do is well we’ll reduce that risk and we’ll change this and we’ll only provide that and we’ll do this and we’ll do the next thing”. ff1.

FBU members raised specific concerns about IRMPs because they view them as ‘not likelihood and outcome based’ and failing to identify types of emergency and establishing expected outcomes. It may be that technical material and guidance below the high level IRMP does pick up these topics but they are still absent from the IRMPs themselves. Usually they are not referenced or linked in these documents. Connected to these shortcomings, there are additional FBU concerns about IRMPs because the organisational risk assessments are not done by emergency type or by significant hazard and the impact of human error can be downplayed.

These concerns are highly relevant. Harrow Court and Shirley Towers for example were the same type of emergency with very similar hazards and outcomes. The consequences for human error were high but avoidable if the pre-fire assessments, information, organisation, training and incident command and control policies and procedures had been put in place or revised and then properly audited between 2005 and 2010. And the full impacts of IRMPs and their related policies have not yet emerged.

"I don't think there have ever been any real IRMPs done properly. I mean it's fascinating that after 1947 until 2004, we seemed to have got all the Fire Stations in the right place. That was a bit lucky wasn't it? We are doing proper risk management plans. Or in Wales it is risk reduction plans which is probably a better term. If you think about it you are planning to reduce your risk instead of just managing for the risk. So I think we have to change it so it's two things. Pre 2004 fire attendance standards were based on the number of pumps and nobody ever talked about the number of people that were on it. At local level we did but government standards said you should have one pump in an A risk and you should have two pumps within five minutes and one within eight minutes and B risk. It was integrated risk management plans that have extended the attendance times. Do I think that's good or bad? I think it's bad but equally if we look at what's happening there is clearly a reduction in the number of fires, there is a reduction in the number of fire deaths but is there an increase in property loss? I think it would be safe to say there is probably significantly more fire damage than there was previously because it is taking us longer to get there and put the fire out so the fire is more advanced. Escape mechanisms are better for people and warning mechanisms and all the rest of it so people are getting out and less people are getting killed but I would rather see eight fire fighters turning up after ten minutes than three turning up after five minutes only for the other five to come or whatever the other number is to make them up and coming later". ff6.

## **FIRE AND RESCUE FRAMEWORKS**

In 2012, the Fire and Rescue National Framework for England was produced and part of it was undoubtedly ideological rather than pragmatic. It was supposedly designed to attack 'Whitehall bureaucracy and red tape' and 'central' controls. Paradoxically the aim was to be achieved by requiring greater collaboration in a very directed manner from central government and with no reference to the benefits of regulating health and safety. This approach focused mainly on community safety and notes the fall in fire deaths at homes since the 1980s. Whilst the ramifications of the framework for firefighters were considerable, these are not addressed and there is one cursory mention of firefighters in the whole document and one to health and safety. The framework flagged IRMPs but only in so far as they looked at community risk and better regulation approaches and did not consider risks to firefighters posed by the framework.

On a more positive note, the 2012 Operational Guidance on Operational Risk Information produced by the CFRA England for DCLG was geared to promoting common principles, practices and procedures but FRSs could choose not to adopt it. The aim was to provide: “robust yet flexible guidance on developing and maintaining a consistent approach to managing, processing and using strategic and tactical operational risk information that can be adapted to the nature, scale and requirements of the individual Fire and Rescue Service” (p2). In the strategic perspective section of the guidance, the first of the policy aims and objectives listed is: “the prevention of injury and ill health of firefighters and other emergency responders” (p17). It is difficult to see how such priorities are actioned in some IRMPs. They have not yet been reviewed across the UK only in Scotland. The data gathering process in the Provision of Operational Risk Information Systems (PORIS) Risk Assessment Matrix, discussed later, does establish firefighter risk as a major category (p49) and this links in with risk management.

In Northern Ireland FBU members may sit on national fire safety bodies and in Scotland, FBU members sit on the Scottish Operational Guidance Board dealing with fires. There may be differences developing in policies and practices but DCLG remains very influential still across the UK especially with regard to bulletins and ‘guidance’ notes.

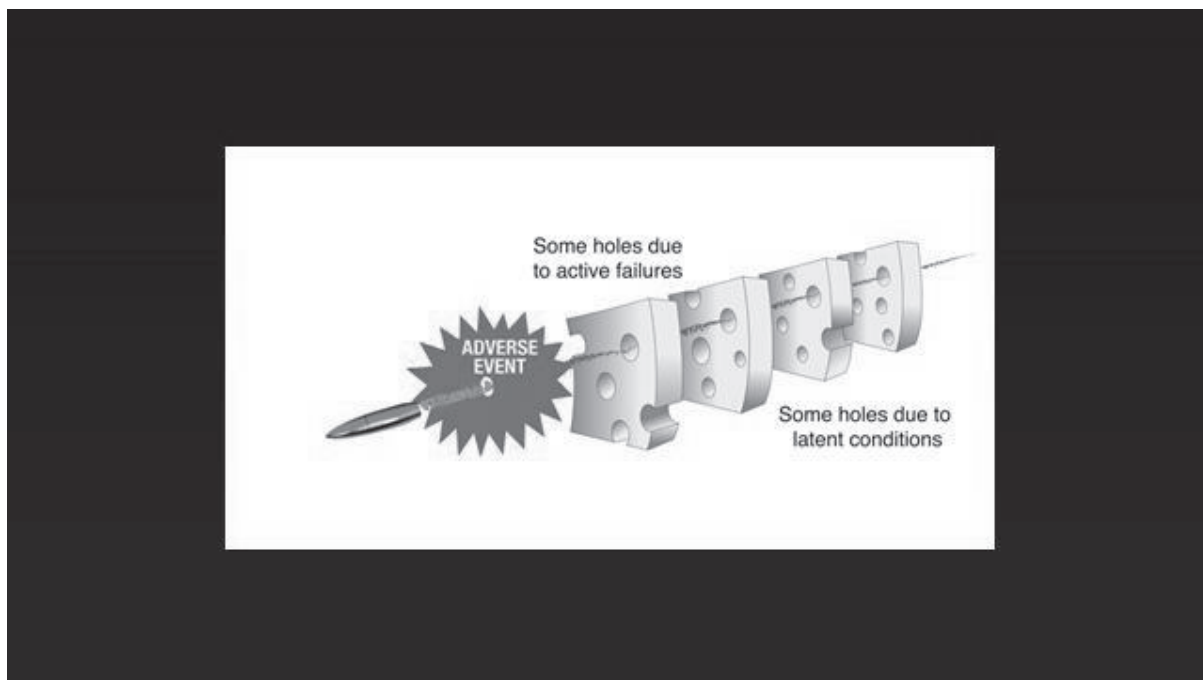
## **KEY FACTORS AFFECTING FATALITIES AT FIRES**

In most of the incidents, laws, regulations, guidance and standard operating procedures – sometimes very general and sometimes very detailed - existed to protect firefighters and no new legislation emerged. Risk assessment and risk management affected every case, underpinned all too often by a lack of training and experience and sometimes compounded by poor information and communication. Technical guidance may have identified effective safe systems of work in all the fatalities in this report but they were either not operationalised or not operationalised fully on the fireground or through training and experience. The key high level problems came with the top management, usually never adequately acknowledged, and operation of several of the FRSs that repeatedly and across the UK failed to implement existing legislation and follow guidance adequately. These developments ran parallel with changes in government policy, oversight and scrutiny by central and local government and inspection and regulation by HSE. The failing also impacted to a lesser extent on information, equipment and, of greatest concern, implementation of earlier fatality reports.

A smaller number of the incidents, often those resulting in multiple casualties, related partly to a lack of coordination between various bodies - such as planners, building controls and FRSs - in terms of ensuring necessary information about fire hazards and risks was made available to and circulated by those operating fire services and acted upon.

In some cases there were particular problems with materials and methods used in buildings that necessitated changes in building regulations and alarm systems. There were also a smaller but important number of incidents that threw up failures in equipment such as ASDUs, TICs and BA or the lack of necessary equipment such as cutters and access to water supplies, hoses and related equipment suitable to fight the fires in question. In all the incidents, it is clear that multiple upstream failures led to the fatalities. The fire fighter at the fireground has some responsibility for his or her own safety but can do little individually to address the root causes and creators of conditions that put them at risk. In this context the 'swiss cheese' analysis, shown in the diagram below and developed by James Reason and others applies with the failures slipping through several layers to lead to fatalities, serious injury and near misses. These failures were both latent and active. However, the model is often used in ways that can underplay or disguise 'external' or latent environmental factors and organisational, management and training systems as well as policy failures.

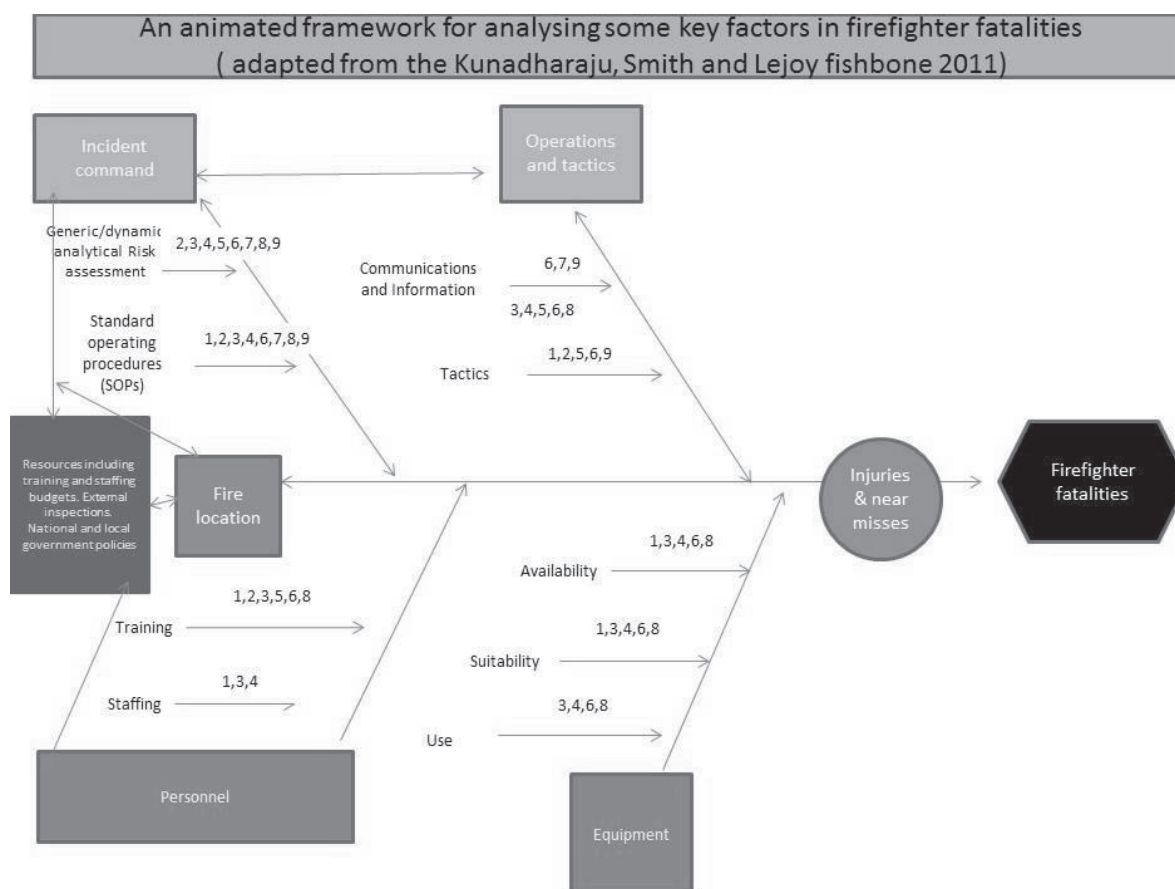
This may lead to an over-emphasis on the human factors and behavioural safety elements in fires and under-estimating the roles of management, inspection and regulatory elements linked to flawed audits.



An articulated 'interactive' fish bone perhaps better illustrates the approach adopted here. For every key element involved in a fire there will be multiple other factors influencing that element as the figure below illustrate. For clarity and simplicity this report simply separates the incidents into pre-fire, fire and post-fire elements. The US fish bone was developed from a large analysis of firefighter fatalities beyond deaths in fires that included a range of health and other causes.

Several bones of the 'fish bones' therefore do not apply to the UK fatalities examined here. So the diagram has been revised and retitled to include the movements within the skeleton. Numbers running along the 'ribs' in the fish bone refer to the fatal incidents described earlier in the text. Colours reflect the relative importance of the key headings in the fish bone – red for the most important 'external factors', purple for the most important factors on the fireground, green for moderately important factors and grey for those where little or no data exist.

The fishbone shows repeated failures by brigades to address the key elements that lead to firefighter fatalities at fires. The failures may be multiple and connected to other failures elsewhere in the fishbone. Hence incident and command and control failures may link to training and experience, management systems and resources, the impact of IRMPs and even government policy and guidance. Failures in BA usage link again to training and experience as well as incident command and control and technical guidance issued at the level. Lack of equipment link in to prioritisation within the brigade, and that links to local government funding and that may connect to central government policy.



Incident numbers. 1. Blaina 1996 2. Limavady 2003 3. Bethnal Green 2004 4. Harrow Court 2005 5. Marlie Farm 2006 6. Atherstone 2007. 7. Balmoral Bar 2009. 8. Shirley Towers 2010 9. Oldham Street 2013

There have been repeated recurrences of common factors across many of the incidents and at all stages – pre-fire, fire and post-fire. Problems identified in 1997 have materialised again in 2013. Firefighters in service now who investigated the fatalities identified many common elements in the incidents and had a list of priority causes that were very similar to those tabulated here. ‘Upstream’ factors were viewed as the primary concern. One noted that a number of factors usually ‘conspired’ to cause the fatality and traced a number of the most significant problems back to 2004.

“(in) 2004 the Fire Service the leadership of the Fire Service changed and in effect what is lost is any sort of independent scrutiny. We lost the Fire Service Inspectorate which was a bit like a governing body that went round and actually made sure that Fire Service views measured up to the minimum standards ....whether it would be at establishment levels or how they responded or how they were organised, how they were trained. Since 2004 we’ve become an entity that is almost self-policing. If you want to scrutiny audits then we tend to get our neighbouring chummy Brigades to do it which obviously I don’t think is effective. But also what you’ve got now is you’ve got the pressure of austerity”. ff8.

The IRMPs provide the framework and machinery within which firefighting goes on and provide the basis for staffing, resources, training budgets and other elements that create safe working conditions and effective management at fires. But whether the high level policy making of the plan reflects what finally occurs at the fireground is a moot point.

Several of the fatal fires also involved either a lack of information or inspection or a lack of communication about information gathered prior to the fire linked to appropriate training. This was the case at Marlie Farm and Atherstone for example. Government had a role and again the same fire produced this observation:-

“At the time of Shirley Towers the CLG was supposed to produce some guidance for Harrow Court on what information was required and how it should be organised. But that hadn’t been published so that was stuff that was sat with the CLG that hadn’t been completed at the time and that was completed April 2012 I think just before the Shirley Towers enquiry”. ff8.

Continued lack of detailed data on fatalities and near misses means that learning from occupational health and safety mistakes before a fire starts can be limited or even non-existent. There may be issues with regard to the accuracy and availability of information about the various premises that firefighters could be called to. These were major factors in 2003, 2004, 2005, 2006, 2007 and 2010. Fire prevention work and fire visits are inextricably linked to the ability to fight fires safely.



Prioritising fire prevention in homes is important but with the staff available, this inevitably may lead to less inspection of commercial and other properties and lower familiarity by firefighters with the layout and hazards of such properties.

“The (location) is a good example pre modernisation that crews would have been in the (premises) doing their fire precautions inspection and would have found that they’ve actually got a (room) in the premises in ....but because we’ve stopped doing that they were oblivious they didn’t have a clue and any plans that they had didn’t reflect it”. ff1.

Public expenditure cuts and high level policy decisions about resources also had indirect effects on firefighter safety according to one firefighter:-

“It may not have a direct impact on the number of people on fire engines but it is starting to have that now. It tends to take away some of the background support people who would have been making sure that all the documents, procedures, equipment were all up to scratch. Over time what you tend to do is start unpicking, you’re not sacking people but you’re not replacing the people who undertook those roles. Also there is a change in the depth of knowledge people seem to have so policies and procedures are different. The Fire Service is trying to do so much I think we are just spreading our skills too thinly to try and cover all the extra functions we are trying to take up”. ff8.

Background support, control room issues and pre-fire intelligence issues were all important factors in Marlie Farm, Harrow Court, Atherstone Shirley Towers and Dalry Rd. For others, fatalities could be linked to incorrect information, a lack of information or lack of inspections of premises and this links to staffing, work role and work load.

“I think fire fighters across the country are spending more time doing community fire safety, visiting homes, you know, but not necessarily visiting the risks that they are going to face”. ff6.

Cutting fire fighter numbers and stations can therefore impact on intelligence-gathering and pre-fire preparations as well as speed in reaching firegrounds and crew levels when they get there. Problems with entrances and exits, other layout features and storage and building materials so critical in fires in 2003, 2004, 2005, 2006, 2007, 2009, 2010 and 2013 would all be identified in pre-fire stages if FRSs are properly resourced and supported by incident analysis carried out by DCLG, CFRA/CFRAU and brigades.

As one firefighter observed:

“Well the maxim is a fire fighter, is a fire fighter, is a fire fighter but that’s not the case at all. It’s a big span of incidents that you are used to dealing with in a big urban town like was like say Belfast or London it’s a big span and you don’t have the same span ordinarily in rural areas there will be grass fires and you’ve car fires and RTA and the odd house fire so if they end up getting something a bit bigger than that that’s when you end up getting big problems because they don’t have the experience of it. Again there is a certain reason why we did the high rise stuff because it was only getting the experience on a day to day basis of it that we foresaw that there was a real risk of something very seriously bad happening, you know”. ff5.

And resources may have an impact on responses both for the public and firefighter. In Northern Ireland there was a view that:-

“we tend to have a better, my understanding, better resourcing of the retained areas in most GB places all of our retained stations have two pumps which isn’t the case in GB. So we do have a better weight of attack as well and a quicker response to some because we are bigger retained area but we do have good response and the troubles its fading away now but the experience that people gained during that because we were going all over the country as well. ff4.

Many concerns about incident command at fires were raised focusing on both hazard and risk assessment:-

“the incident command structure absolutely failing because it’s failed to identify the hazards and the risks that are present for the people that they are putting into the risk area. They have failed to do that because they’ve been totally focused on extinguishing the fire without actually reaching any seat of fire. So realistically after the first hour that they were there they were never going to extinguish that fire by the means that they were employing. So they need to, they need to have a look at the risk culture within the Service and whether managers understand the risk assessment process because I don’t believe they do”. ff2.

And again:-

“but because there are fewer incidents nowadays we are so focused on training but not just your firefighters your officers in charge have no real experience of dealing with a lot of these incidents whereas it was bread and butter years ago”. ff4.

## Post-fire: procedures for investigating fatalities, injuries and near misses

“Fire Services get anxious that they are going to get blamed for something and there doesn’t seem to be a willingness to get information out there to share with other services whether it’s because they feel, they are going to be criticised because they see it as some kind of failure and therefore want to try and keep it in house. This is a real common thing: let’s try and keep this within the Brigade. Others will deny “well that wouldn’t have happened here”. I think most of the incidents that have happened around the country could probably happen anywhere”. ff6.

The analyses of incidents may be held up for a variety of reasons so that lessons to be learnt are delayed or missed. This appears to be the case especially with the fires of 2004, 2005, 2006, 2007 and 2009. It is unclear if general lessons learnt by coroners or FAs are always rolled out in Rule 43 and similar letters. It is also unclear how exactly FRSs are audited after fires and for how long. Increasingly brigades may be self-regulated and self-audited or use peer-reviews and commercial organisations to assess their performance.

The extent to which brigades across the UK act upon reports of fatalities at fires and then continue to review and apply good practice is not clear. The role of the DCLG, CFRA and CFOAs in this process is also unclear. HSE has a statutory role in investigating fatalities and injuries in the workplace but it is the exception and not the norm currently that their reports are put in the public domain. Their capacity to inspect FRSs on regular basis has also been diminished with staff and resource cuts.

Where fatal incidents occurred firefighters were often puzzled by what they perceived to be a lack of guidance and this affected both incident commanders and the firefighters.

“We were surprised. This is going a little bit back a bit in the conversation, but we were surprised at how little guidance the UK fire Services got for basement fires and that’s still the case. So it then becomes difficult to measure what happened on the night against what should have happened the basement is just classed as firefighting the buildings. It’s a building so therefore they are not recognising the characteristics of the basement and so the guidance isn’t there for Incident Commanders and for the fire fighters to go to deal with what they are presented with”. ff2.

General lessons to be learnt that might apply across several recent firefighter fatalities, as distinct from analysis of specific incidents, appear to fall outside or be ignored by government departments, chief fire officer groups and the CFRA. Rule 43 letters sometimes comment on more than one fatality but no one seems to have a brief to look at the fatalities in total.

Yet there are many recurring elements to these fatalities and FBU members have reflected on the wider picture and some possibly broad lessons that can be learnt from many or all of the UK fatalities recorded in the last ten or more years.

“There was nothing in those buildings that we shouldn’t have been aware of. So I think the command and control was about training (and) is about having systems, predetermined safe systems if you like or safe systems will work for people. It doesn’t take away the need for almost a constant risk assessment process. If managers and fire fighters for that matter are trained in order to do that then of course (it) needs building into that training. There also has to be a way of communicating that information as often I think we’ve found evidence that suggests that people were aware of risks but it was not getting communicated around the fireground”. ff6.

### **‘CHIEF FIRE AND RESCUE ADVISORS ‘(CFRA) AND THE CHIEF FIRE AND RESCUE ADVISORY UNIT (CFRAU) IN ENGLAND, NORTHERN IRELAND AND WALES AND HM INSPECTOR OF FIRES IN SCOTLAND**

In England, the CFRA is employed by DCLG and “provides strategic advice and guidance to ministers, civil servants, fire and rescue authorities in England and other partners (including the devolved administrations, the police and Health and Safety Executive), on the structure, organisation and performance of fire and rescue authorities” (DCLG July 2014). The CFRA can also commission operational guidance and these include key GRAs - and BA Operational training guidance – to meet the requirements of the Management of Health and Safety at Work regulations.

Such activities include a strategic view of firefighter fatalities at fires and work with HSE and the police on such matters. Despite repeated requests and phone calls, at the time of writing this report, the CFRA office has not responded to requests for more information about their current role, functions and work, if any, on fire fighter fatalities in the UK. The CFRA role has been much diminished and now appears to have a stronger focus on policies dealing efficiency and value for money rather than to evaluating how such policies can or will impact on public and firefighter safety.

A properly staffed and resourced CFRA office with an active CFRU should be a major contributor to solving the problems relating to firefighter fatalities at fires.

“The advisors should be telling the Minister that everything is OK or if everything is not OK but it’s so under resourced aid. There is no an inspection regime as I keep coming back to that”. ff6.

Similar post holders elsewhere in the UK advise their respective governments. The role has been reduced in England in terms of responsibilities, resources and time. They do not operate like the Chief Fire Inspectors of the past. There was a consensus among the firefighters interviewed that although the fire inspectorate may not have been perfect, the lack of a proper replacement for it had damaged the capacity of the UK fire service to deal with occupational health and safety.

The fragmentation and loss of oversight are major limitations. Delays in drawing wider conclusions from several individual fires were flagged as particularly serious.

There also appear to be growing differences between the four UK countries in terms of government policies and some priorities and practices of FRSs. In 2013, HM Fire Inspectorate Scotland carried out a review of what is now one unified Scottish FRS and provided a case study of community and fire fighter safety linked to risk modelling and the fire service emergency cover model although occupational health and safety was otherwise neglected.

Further disparities emerge that have implications for both public and firefighter safety in different parts of the country.

“Now we had a fire in an old peoples home in country X a few years ago, there were lots of learning points from that about response time, about knowledge of the building, about gathering operational risk information and out of that country X changed their regulations so that now you have to put sprinklers in old people’s homes but nothing happened in other countries. The regulations certainly weren’t changed and even the learning points about the fact that the fire fighters actually they turned up at the back door instead of the front door because they didn’t know the building well enough but that was never passed around the Fire Services in England to learn from because it’s almost as though well Scotland is a different country and what happens in Scotland is nothing to do with us it might as well be Germany for all the interest that we have in it”.  
ff7.

A number of service recommendations on procedures, audits and training had been implemented according to a group headed by Sir Ken Knight and including the CFRAU. However, it is now difficult to locate publicly available reports and recommendations on such firefighter fatalities from the web pages on the CFRA. There are occasional references in fatality reports to both the role of the CFRA and CFRAU. The work of the CFRAU is not currently mentioned on the main English government – DCLG - web site and its role is very unclear. With publication of ‘In the Line of Duty’ report by LRD and FBU in 2008, the UK minister responsible for fire at CLG, Sadiq Khan, responded to the report’s recommendations. In 2008 the Minister was considering the benefits of a co-ordinated approach to the collection and analysis of data on firefighter deaths and injuries and an independent fire and rescue service investigation unit. In 2013, no such data collection and analysis system existed and the role of the CFRA has been downgraded and no investigation unit has been established.

The CFOA chaired the English Fire and Rescue Service Practitioner Forum that met regularly for many years and advised government on fire and rescue-related policies. By 2008 it had had 33 meetings until disbanded following the last election. This body included senior fire officers, Local Government Association members, a range of trade unions, fire service college staff. Meetings were usually attended by Scottish and Welsh local or central government officers. Firefighters saw it as a forum where discussion about firefighter fatalities at fires could happen.

“We had a thing called the Practitioners Forum and they thought that it was the Central Fire Brigades Advisory Council and they just sort of changed its name now. They were meeting places at a national level for all of the Stakeholders in Fire and Rescue (including) the Chief Fire Rescue Adviser or HMI before that and all of the people who had an interest in the fire rescue and what would have happened. Ideally, I’m not saying it happened all the time but if there was something (related to) the Rule 43 Letters, especially something that was to do with a fire fighter fatality, then that would have been raised at that level in that national organisation whichever one it was. We, the Fire Service would have decided what we would do with it. Should we write a Dear Chief Officer letter, should we update a Manual of Firemanship, should we write to so and so and get them to change something else and that’s how it would have happened. Since the last election, the Practitioner (Forum) has fallen. Its last incarnation just folded up and disappeared. The reason was that at the last election the DCLG halved the funding that it gave to the CFOA. The CFOA said “well if you’re going to cut our money then we are not going to chair all these meetings”. So they stopped organising the meetings so then the whole thing just withered and died. What it means now is that if you take Shirley Towers I’m sure a Rule 43 Letter would have been sent to Hampshire Fire and Rescue Service but nobody else knew anything about it but yeah it may have been circulated around the findings may have come out and all that. But nobody centrally looked at it and said “what are the lessons from this that the whole of the country can learn”? ff7

“(The CFRA England) seems to have had very little impact in my opinion. It feels an almost kind of toothless office. I’m not aware of them really taking any action that’s called anybody to account. They have been not very critical about anybody. It doesn’t feel independent to me again its ex-Chief Officers that tend to be in there and so it doesn’t have an independent feel. If your advisers are all ex-managers, you know ...”. ff6.

## LOCAL GOVERNMENT AND THE LOCAL GOVERNMENT ASSOCIATION ENGLAND (LGA) AND OTHER SIMILAR BODIES IN THE UK

“My experience would suggest that most fire authorities leave everything ...to the Chief Officer and he is obviously employed to advise them on those matters. But I think sometimes there is a lack of understanding of their responsibility under the IRMP. Now they get away with that because there are no checks. ....There’s not that body lying behind that to say “we can come and check your IRMP” ... It’s quite clear at the moment that risk plans are being made on the basis of budget. You occasionally hear a Chief Police Officer saying, “you’ll end up with more crime, very rarely you hear a Chief Fire Officer saying “I can’t run my Service with any less money. I’m going to have to shut Fire Stations and people will die”. Very rarely you hear that because they are a different kind of breed of politician if you like in my opinion. And unless the local authorities are held to account then I don’t know. My understanding for example is that there are Fire Authorities who build into their risk plan that they will get an improvement notice served on them by the Health and Safety Executive and they might even get a prosecution but that’s a chance that they are prepared to take because it can save them a lot of money”. ff6.

Local government funds the various county and geographical fire brigades across the UK. Central government sets and controls significant parts of local authority spending. So the relationship between central and local government is critical to the staffing and resourcing of fire services and impacts on firefighter safety directly. In England the Local Government Association (LGA) works on cross-authority policy and agreements. Elsewhere in the UK other bodies perform similar functions. Historically these umbrella groups have contributed to a range of initiatives affecting firefighter safety working with the CFOA from the FRs.

With considerable public expenditure cuts working their way through, threats to both public safety and firefighter health and safety - the two are inextricably intertwined because what hits one, affects the other - are growing. Particular local authorities have proposed huge retrenchment programmes without providing good quality evidence of their impacts on public and firefighter safety. This is currently the case in London with cuts in fire station numbers, appliances and staff. Yet the lessons to be learnt from several of the fatality and some of the near miss incidents discussed in this report relate to speed of pumps reaching fires, the numbers of well-equipped firefighters available to fight fires safely and the speed of back-up in reaching firegrounds. In 2012 the CFOA/LGA Operational Assessment and Fire Peer Challenge Toolkit was produced. The document notes “In the new policy landscape with the abolition of the inspection and regulatory regime and the national performance framework, there is a shift towards local accountability for performance and self-regulation. This fits well with the governance of FRAs, and the sector led approach to improvement”.



These sort of initiatives are likely to present major threats to both public and firefighter safety. It may also mean that changes like those proposed in London will escape effective oversight and assessment and could lead to increase public and firefighter safety risks.

## **ROLE OF FRSs**

These vary enormously across the UK and in England are bodies funded by and accountable in the first instance to local authorities. They are headed by Chief Fire Officers who also have a Chief Fire Officer's Association (CFOA). It is not possible to establish from FRS web pages or the CFOA web page the extent to which reports on firefighter fatalities at fires from various bodies are circulated and discussed. It is assumed they are because various FRS board minutes contain references to such reports but the extent to which all FRSs act upon recommendations cannot currently be established. Northern Ireland (NIFRS) has its own chief fire officer with areas and districts and a set-up where, due to the recent history of the country, co-operation and collaboration between all the emergency services functions very effectively. These special circumstances have also ensured that resources for firefighting have been available and substantial in the country when needed but moves in 2014/15 to a rolling annual budget may well threaten that position.

Elsewhere in the UK, opinions vary about the effectiveness of the chief officers. They have a key role, and should have related responsibilities in establishing risk management strategies and policies linked to resources and technical developments and their operationalisation. These structures and environments are then critical to firefighter health and safety and failings in them explain several of the firefighter deaths at fires. it will be a different matter".

FRSs were given the role of producing IRMPs in 2003. FRSs have responded in many ways to incidents, to HSE and other bodies' activities on the risks to firefighter at fires. An interesting response, for example, came from the Essex County FRS (ECFRS) which was not involved in any of the fatal incidents mentioned in this report nor in any of the HSE inspections at that time. In 2011, the fire authority actively discussed a Health and Safety Update linked to the National HSE Consolidation Report and the ROSPA Quality Safety Audit of the ECFRS. The authority was aware that "little or no proactive inspection of the FRS had been carried out for a number of years": probably reflecting the national position. This again begs the question about what HSE and other overseers or regulators had been doing in FRSs. A fragmented UK picture emerges of responses to the firefighter fatality incidents especially in terms of addressing 'environmental' root causes and underlying structural and procedural problems.

With the public sector cuts, chief officers have been required to cut their own budgets and have been placed under significant pressure to reduce spending on critical activities that affect firefighter health and safety. In some instances, chief officers have been asked to cut firefighter training – in one instance relating to firefighter breathing apparatus training.

One chief officer called the bluff of the ‘cutters’ and indicated this could be done but if a court case arose with regard to BA training failures, the funder would need to answer to the courts. These proposed cuts were then dropped.

Concerns were expressed by several firefighters about how brigades investigated near misses and serious injuries at fires that did not lead to fatalities. For example FBU prompted reporting of incidents with cables in one brigade but although six were ‘remembered’, only two near misses were reported. The contrast with fatal investigations in terms of resources, time and personnel utilised was stark. Firefighters perceived a reluctance on the part of the brigades to acknowledge problems because this would highlight cuts and deficiencies in training and equipment. Instead there was also a perception that brigade managers focused on human factors rather than systemic failings.

Firefighters also had views about the HSE inspection of several brigades published in 2010 and the peer reviews that individual brigades were carrying out.

“There has been no follow up from the HSE 2010 (inspections) to say “OK well what have people done about those”? So that was left back to the Service and I don’t think the Service has a good inspection regime. They don’t have anybody really available at the moment to inspect. They are doing peer, peer reviews is the only thing that really gets done at the moment and I don’t think that that’s either independent enough or critical enough so it doesn’t seem to be effective. The recommendations I mean the Rule 43 Letters I think after Harrow Court, we identified working with the HSE. The Rule 43 Letters weren’t even being distributed. So therefore the Rule 43 Letter that was served on Hertfordshire wasn’t circulated to every other Brigade in the country. So working with HSC and working with then the Chief Fire and Rescue Advisers we said “look, you get it sent to every Brigade”. They agreed that’s what they would do from now on. Every time they got a Rule 43 Letter they would issue it on a sort of circular so that people could say well, “there’s a Rule 43 that’s been issued there”. I’m not sure there is a good enough mechanism for ensuring that lessons learned are acted on and that’s down to inspection and review”. ff6

In 2014, the recognition that some brigades might have high occupational health and safety standards to protect firefighters at fires did not necessarily influence all other UK brigades.

**LEGAL MATTERS - THE COURTS, INQUESTS, FATAL ACCIDENT INQUIRIES (FAIs), CORONERS AND THE POLICE INCLUDING THE CROWN PROSECUTION SERVICE (CPS) (ENGLAND AND WALES), THE CROWN OFFICE PROCURATOR FISCAL'S UNIT (SCOTLAND) AND THE DIRECTOR OF PUBLIC PROSECUTIONS (NORTHERN IRELAND).**

Based on investigations by the police and HSE, the CPS or Crown Office may prosecute, under the 1974 Health and Safety at Work etc Act and the Corporate Manslaughter and Homicide Act 2007 (which applies to corporate liability and not individuals) and related regulations and legislation, owners of premises involved in fatal fires, local authorities and FRSs that run the fire services and in some circumstances individual fire officers. The CPS has now produced a statement of principle relating to 'heroic acts by police officers and firefighters. This reads as follows: "The CPS recognises that, in performing a heroic act, a police officer or fire-fighter may breach section 7 of the Health and Safety at Work Act etc. 1974 (HASAWA), in that they failed to take reasonable care of their own safety. In those circumstances, and where the safety of others is not put at risk, public interest would not be served by taking forward a prosecution under section 7 of the 1974 Act". (Last updated 7<sup>th</sup> November 2013).

Much will therefore depend on assessing the risks and the circumstances and the capacity of officers to determine that the safety of others is not put at risk. The CPS further adds: "although it is very unlikely that an officer would be investigated in such circumstances, prosecutors may be asked by investigators to consider whether such a "heroic act" such as this should be subject to prosecution under section 7 HASAWA if a case is referred to them by investigators. Each case must be considered on its own merits and prosecutors will apply the Full Code Test set out in the Code for Crown Prosecutors, and they should also apply the following considerations". Solicitors and barristers may represent FRSs, FBU, Central and local Government. In several of the incidents involving criminal and civil law matters, legal cases have resulted in both major delays in completing investigations of incidents and in rolling out interim and urgent recommendations for action. Whilst documents and guidance issues by several bodies on dealing with deaths at work emphasise the need for matters to be dealt with as speedily as possible, the practice for whatever reasons has been poor. Improved protocols and procedures for fatal accident investigations have failed to resolve the problem.

Investigations of fatalities may be time-consuming and difficult from a legal perspective across the UK. Proper preparation of cases is clearly very important and may be lengthy. However, ways and means of speeding up the legal process are urgently needed. Delays of five, seven and eight years have occurred with regard to firefighter fatalities at fires and some case going back eight years have not been fully settled. For example Marlie Farm happened eight years ago, Atherstone seven years ago and the Balmoral Bar Fatality occurred five years ago and that case has just reached court. This should be considered unacceptable for families of those firefighters killed and also for those injured.

There are problems with the time inquests and fatal accident inquiries (FAIs) may take partly because inquests cannot be held if there are criminal investigations relating to murder, and corporate and individual manslaughter underway and partly because verdicts may be delayed for a variety of other reasons. Sometimes inquests are denied after there have been court cases and related investigations as happened with the Atherstone deaths of 2007. With no inquest in this case, no Rule 43 letter could of course be issued requiring parties involved to respond and flagging up matters of importance beyond the local area. This is to be regretted as is the distress caused to the families of the deceased who lack proper resolution of the causes of death. If coroners' verdicts are delivered without unnecessary delay, they will often be of value to all those involved with firefighter health and safety in future prevention of injury planning.

The role of the police in carrying UK-wide investigations work-related deaths has not been well researched and little has been published on this topic. Again firefighters involved in fatalities had mixed views about the police. As one noted:-

"The Police were kind of in a completely alien way to what we were used to. They tell you what they want and you ask what you want and they say "OK. Thanks for that" and they give you nothing. We did get bits and pieces from the Police. We had a good relationship with them. We were involved right from the start with the way they conducted interviews, the way that the, the environment they were conducting them in and the facilities that they were going to provide recording or watching the videos remotely, transcript information. We always tried to get access to that and we were never successful but, but, we were there right from the very start before the interviews started and pretty much to the end". ff 2.

Others were even more critical:-

"I wonder about how much we should cooperate with the cops to be perfectly honest because we are bending over backwards to help the cops but why would we bother? Because actually they haven't produced a single conviction that leads to improvements in the Fire Service for our members or leads to improved compensation or anything else I think that they perhaps need to be subservient to the Health and Safety Investigation rather than the other way round". ff6.

The police role proved most problematic at Atherstone in 2007 where prepared cases against fire service line managers but not senior managers. They failed to find the arsonists who started the fire. They did not take action against either the owners or planners although evidence indicated their acts or omissions affected both the course of the fire and the vulnerability of the firefighters. Further problems emerged when the police seized FRS reports that shed light on health and safety issues that affected firefighters after the fire.

“In liberal democracies, policing is inherently contradictory, since the law must guarantee the stability of a social order that is based on unequal relations of property and at the same time seek to uphold formal equalities in law. This is where the real difficulty lies in challenging the contributory negligence of the victim or in understanding that safety crimes are based upon the pursuit of economic interest in a system of unequal power relations. The reconstruction of senior management as potential criminals, or the idea that the dangerous conduct of victims might be the result of workplace pressures, rather than incompetence, apathy or laziness, requires a developed understanding of unequal power in the workplace and how workplace routines are mediated by power relations”. (Alvesalo and Whyte 2007:72 and see Snell and Tombs 2011). They may conduct investigations with the HSE and their work will inform both criminal proceedings and coroners and other lawyers in Scotland. Based on their experiences, some firefighters proposed a different arrangement with the police and other agencies.

“I think there is a desperate need for a memorandum and understanding between ourselves and the Police and all the various between ourselves and the enforcing authorities. It’s badly needed. We get inconsistency as to how the Police and the HSE operate in different parts of the country when these events happen”. ff 3.

## **ROLE OF THE HEALTH AND SAFETY REGULATOR AND ENFORCER: THE HSE**

HSE has the primary and vital role in investigating work-related fatalities and other serious incidents across Great Britain. However, the HSE has not itself instituted any legal proceedings following the investigation of fatalities to fire fighters between 2002/3 and 2012/13. Although HSE has investigated such incidents, they have done so in conjunction with the police “who have retained primacy in these cases”. Any resulting prosecution action was therefore decided by the Crown Prosecution Service (CPS) in England and Wales or the Crown Office and Procurator Fiscal Service (COPFS) in Scotland” (HSE Correspondence FOI request – 2013110278. 27<sup>th</sup> January 2014).

HSE could prosecute employers for other offences under health and safety legislation and have issued enforcement notices in the past to fire services. Reports on firefighter fatalities do not appear to be automatically within the public domain. In some instances, this is unavoidable and relates to court proceedings, but in many cases, there seems to be no good reason for secrecy. Indeed, the need to rapidly learn the lesson of fire fighter fatalities should require such access to be rapid and full. The resources and staffing of HSE have been steadily eroded over several years and its capacity to carry out active inspections and support prosecutions has been significantly weakened across the UK (Watterson and O’Neill 2012). Their reduced geographical presence also has an impact and may be especially important in rural and remote areas. The heavily-cut HSE has a nationally reduced role in UK occupational health and safety regulation, inspection and enforcement.

There are strong arguments for a dedicated and properly resourced HSE group dealing with fatalities, injuries, near misses and the occupational health of emergency workers including firefighters. The current HSE emergency services section appears to lack the staff, resources and time to perform such a function. With regard to the fire service as a whole, a HSE consolidated report exists on only eight inspections of FRSs conducted in 2009/10 and published in 2010. The HSE has a web site on fire services covering resources, statistics, reports and publications but it provides no specific reports there on fatality investigations. The topic does not appear to be a priority. Yet the HSE did fund a research project on managing sickness attendance within the fire service that should have been a much lower priority than preventing fatalities, injuries and occupational diseases. The 2010 consolidated report of inspections is on the web.

Numerous specific problems therefore emerge with HSE. For example valuable HSL work on firework explosives prior to the Marlie Farm fatalities in 2006 could have been circulated more widely. HSE could have checked that county FRSs had made it available to firefighters. A more recent request to HSE for information about firefighter fatalities illustrates the problem (November 2013). The HSE region covering Bethnal Green, London and Harrow Court, Herts was unable to identify the firefighter fatalities in these two places in their information systems based on year and place of fire.

HSE have produced some useful guidance on a range of acts, regulations and codes that relate in general terms to health and safety of firefighters. The 1999 2<sup>nd</sup> edition of the Guide to Reducing Error and Influencing Behaviour (HSG 48) has some relevance to FRSs and to the incidents discussed in this report. It specifically addresses the need to design workplaces for people which is important in terms of the conditions on firegrounds that firefighters may encounter. Even more important for the job of firefighting is the emphasis on risk assessments and managing influences for example with regard to shift work and fatigue which links to heat stress and workload on the fireground.

HSE has played an important role in developing policies and high level actions on firefighter safety based on their understanding of the 1974 Health and Safety at Work etc Act. Firefighters protect public safety in hazardous situations such as fires by necessarily putting themselves at different degrees of risk. HSE produced a document in 2010, after discussion with and general agreement from employers and trade unions involved on "Striking the Balance between operational and health and safety duties in the Fire and Rescue Services". This document in parts confuses the employers' role with the employees. HSE "recognises that firefighters and managers face difficult moral dilemmas and have to make decisions in what are sometimes extremely hazardous, emotionally charged and fast moving situations". Problems emerge in working out what is meant by a culture that is 'sensible, proportionate and thought-through'.

How this is to be implemented and by whom remains unclear. Similar problems apply when working out how exactly good health and safety management systems can 'enable staff to take appropriate care for their own, their colleagues' and the public's health and safety'; and how it is possible to assess fire service actions with regard to health and safety management systems, procedures and incidents.

Some firefighters thought the 'Striking the Balance between operational and H&S duties in the Fire and Rescue Services' documents had had little impact among fire crews:-

" I can see that and I can see what its intentions are but ask a fire fighter at a Station what Striking the Balance is and they won't have a clue. They won't be able to point to anything that has come as a result of striking the balance being published. So it's recognised and I think that it should make Services think again but I'm not convinced that it has"? ff3.

Others felt the policy did not work particularly well because of the weight still given to DRAs.

"People were aware it. (Firefighting) was a sort of dirty and dangerous job and that, for me it still drives the responsibility down to this kind of safe person concept. So, you have an individual who is responsible for their own safety and I think that in some ways they will be criticised if they do and criticised if they don't. I mean you take the classic of Police Officers either being prepared or not prepared to jump into fast moving water to save a child. You know, they will be criticised, if they don't jump in. If they do jump in they are probably going to drown. So where is the balance in that? Well the balance is they die a hero. So, I think that the danger of that sort of striking the balance was that continued reliance on dynamic risk assessment, safe person and taking the responsibility away from the organisation to make sure their workers are safe and behave safely". ff6.

The HSE document, 'Heroism in the fire and rescue service' (HSE nd), issued in 2013 states "It is also important to recognise that firefighters should not be expected to put themselves at unreasonable risk, even in the face of sometimes unrealistic public expectations". It further adds that: "HSE views the actions of firefighters as truly heroic when it is clear that they have decided to act entirely of their own volition in putting themselves at risk to protect the public or colleagues and there have been no orders or other directions from senior officers to do so and when their actions have not put other firefighters at similar high risk". Perversely it then provides a case study of the Atherstone fire where there was no risk to the public and notes that "the team of four firefighters made their decisions based on their comprehensive training" and further that all (the four dead firefighters) were "fully aware of the risks and agreed on their actions without instruction or pressure from officers". If training was comprehensive and the four firefighters were fully 'risk aware' it is difficult to understand how the fatalities occurred.



Some of the firefighters interviewed had a different analysis of these HSE documents and how the HSE explained firefighter fatalities. One noted:-

“We are probably talking about different things then because you are suggesting that that HSE document says you can do something to save saveable life without fear of prosecution on the basis that all the processes and procedures are in place. Well I know that they are not in place and that’s why I think that that’s a damaging publication. But for me the HSE came out with a document about Heroism in the Fire Service that gives people, puts the moral pressure on people to do something outside the procedures and if they don’t have the right crews”. ff2

And another observed:-

“What it’s for (Heroism in the Fire Service). It’s for the Police Officer who decides to chase a burglar across the roof of a warehouse and on their own they can decide to put themselves in that situation and be a hero or not. Fire fighters do not do that, fire fighters never act alone so how can a fire fighter carry out an act of individual heroism when they always wear breathing apparatus in pairs. If a Policeman falls through the roof of a factor and breaks his leg well the ambulance service will just come and take him to hospital. If a fire fighter falls through the floor of a burning house, other fire fighters have got to go into that burning house to rescue them so everything you do puts somebody else at risk in the Fire Service. As a result it’s completely meaningless to the Fire Service”. ff7.

Better surveillance by HSE of FRSs post 2004 could have ensured that recurrent failures of FRSs pre-fires, during fires and post-fires were addressed. The views of firefighters about HSE vary from one part of the country to another and from one incident to another. When fatalities occurred, the firefighters found the HSE to be supportive in some areas and not in others. Prior to one fatality, the FBU had invited HSE in to look at their brigade:

“So we asked HSE to come in and have a look at that and they did and they came in and we sat and talked to them and they went and sat down and spoke to the Service. Their response was disappointing from our point of view because as I said they took everything that the Service said on face value and said “they’ve told us that that they have this, this, this and this and so we content that they’ve got that and so we are not going to do anything, we are not going to take any action”. ff2.

## THE INTERNATIONAL POSITION ON FIREFIGHTER DEATHS AT FIRES

Making comparisons between different countries on firefighter safety is difficult because of often major differences in staffing, equipment, procedures and policies. The USA has a poor record on firefighter fatalities or at least one that has not improved as rapidly as it was expected to. However, the USA does have better statistics and incident investigation procedures and what seems to be a better information dissemination system. There are also a number of US studies that have recently analysed fatalities in structure fires over the period 1977 and 2009 and major efforts are being made to reduce such fatalities (Fahy 2010). Since 1977, annual US firefighter deaths have dropped by almost two thirds and the annual number of fires in such structures has dropped by 53%. The two trends track fairly closely. The major US cause of fatalities in fires was becoming lost in buildings, structural collapse and fire progression that included explosion, flash over and back draught: similar to several of the UK fatalities described in this report.

The US Government's National Institute of Occupational Safety and Health (NIOSH) investigate all notified firefighter fatalities and now have a data base on such incidents. These provide the means for a broader analysis and researchers regard NIOSH as the key to effective prevention (Hodous et al 2004). Reports of all completed NIOSH investigations are made available on the NIOSH web site. The US further identified patterns of construction collapses in fires and questions around training. They stressed a systems approach where all elements of safety needed to come together to be effective (Fahy et al 2010; Estes et al 2011). Such an approach does not concentrate solely or mainly on human error in preventing firefighter fatalities but requires both access to a population-based source of data on firefighter injuries to establish injury characteristics and a 'case-based surveillance system to work out detailed prevention recommendations (Estes et al 2011).

In 2011, a detailed and methodologically rigorous US analysis was conducted of 189 firefighter line of duty deaths drawing on the NIOSH data base for the years 2004 to 2009. (Kunadharaju et al 2011). The four high order causes of fatalities identified were under-resourcing, inadequate preparation for/anticipation of adverse events during operations, incomplete adoption of incident command and control procedures, and sub-optimal personnel readiness. They were primarily concerned with non-external recommendations. In Sweden, firefighters explain their low fatality rates, in a country where most fires are small fires, as due to building construction where traditional materials are widely used and where nearly all apartments provide 60 minutes of protection before fire will spread to another unit, training and fitness. Also all interior crews always carry a hose line and everyone is required to have a radio and work in pairs (S Pieper. The Swedish perspective on safety. Firefighter Nation. 22<sup>nd</sup> April 2012).

The differences in crew levels and response times between fire services in Europe may be a factor in some incidents that lead to firefighter injuries. However, UK data are needed before this area can be explored further. The table below does show significant differences across Europe. The number of firefighters available to fight fires in itself is not necessarily a 'safety factor' – as the Atherstone fire illustrates - but insufficient numbers can be, linked to training, available equipment and deployment.

France, Netherlands and parts of urban Denmark require six firefighters on pump water tenders and, although their response times for urban fires may be worse than in the UK, it seems likely that such staffing would have helped to avoid firefighter fatalities similar to those in Harrow Court in 2005.

**Table 1 Differences in coordination of appliances/manning and response times in EU countries**

Country	Required manning level for turnout of a turntable ladder	Required manning level for turnout of a pump water tender	Response time for a fire in urban areas
<b>Belgium</b>	2	From 4 to 6	Turnout within the minute by professionals. Response time 8 to 15 minutes for professionals, and 13 to 20 for volunteers
<b>Croatia</b>	2	4 or 5	15 minutes
<b>Denmark</b>	2	6 in Copenhagen, 4 in smaller towns like Roskilde	Turnout must be within the minute of call acceptance. Response time is 15 minutes
<b>Estonia</b>	2	4	5 minutes in urban areas
<b>Finland</b>	1	4	By region: between 6 and 20 minutes
<b>France</b>	2 or 3	From 6 to 8	Depends on the <i>département</i> . Examples: Ain: 20 minutes; Nord: 15 minutes*.
<b>Germany</b>	2 or 3	4 or 5	8 minutes
<b>Italy</b>	1 or 2	5	Depends on the territorial area but must never exceed 20 minutes. In 2009, the response time averaged 15 minutes in central Italy and 13 minutes in the north and south**.
<b>Netherlands</b>	2	6	8 to 10 minutes
<b>Norway</b>	1 in small municipalities, two in towns and cities	At least 3	Turn-out must be within the minute of call acceptance. Response time should be 10 minutes at most in high risk urban areas; 20 minutes in low risk urban areas; and 30 minutes in rural areas.
<b>Slovakia</b>	2 or 3	At least 5	8 minutes
<b>Spain</b>	2 or 3	5 or 6	Varies by region
<b>Sweden</b>	2	5	11 <sup>1</sup> / <sub>2</sub> minutes

\*The prefects of départements tend to lengthen response times to avoid claims

\*\* Ministero dell'Interno. Dipartimento dei Vigili del fuoco del Soccorso Pubblico e della Difesa civile (2009) Annuario statistico del corpo nazionale vigili del fuoco, Roma, p. 54 (Online).

Source: ETUI – EPSU survey 2010 -2011

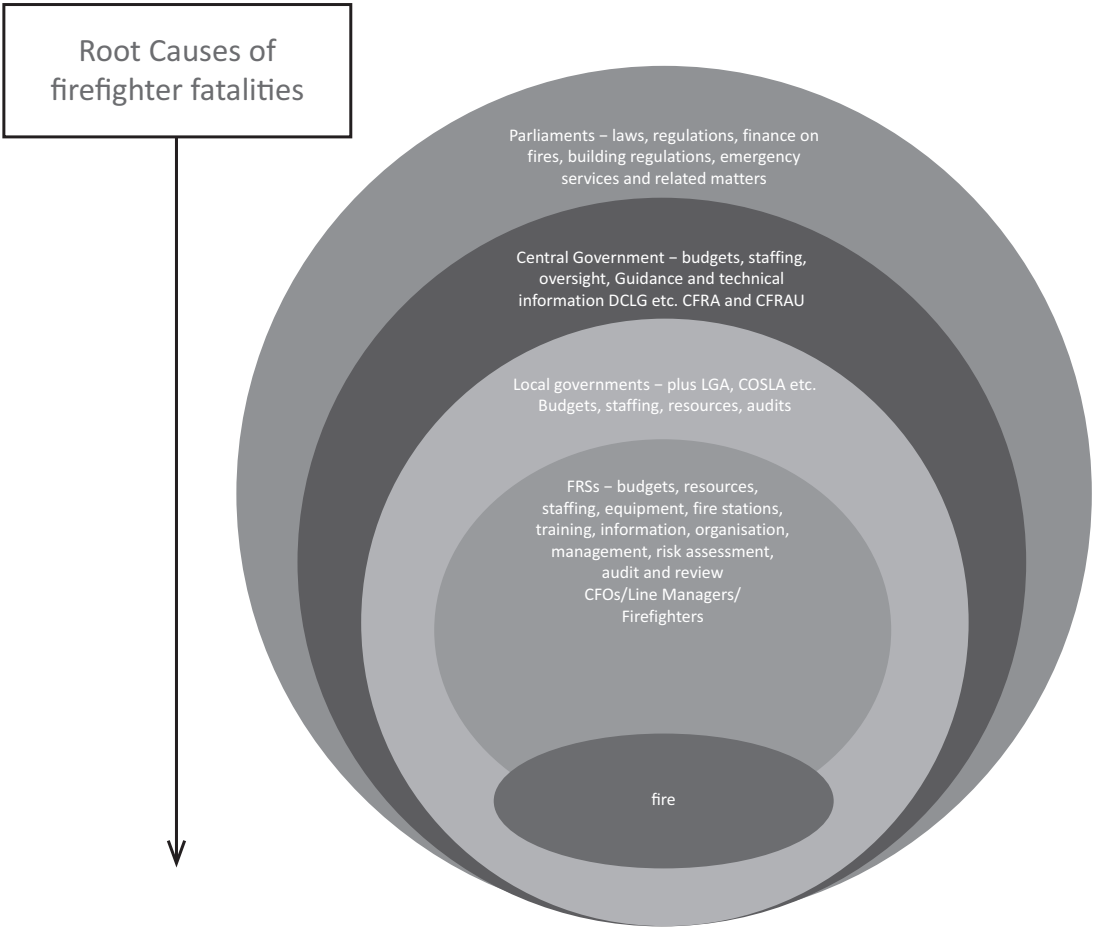
**[Source: Scandella 2012. ETUI. P9.**

CONCLUSIONS

Unnecessary deaths happened in avoidable circumstances. Risks were sometimes taken to save property that should not have been. Risk assessment and risk management failed in some way and in some form in all the fatalities described here. Lessons were not learnt that should have been. Deaths could and should have been prevented.

“We may risk our lives a lot, in a highly calculated manner, to protect saveable lives. We may risk our lives a little, in a highly calculated manner, to protect saveable property.  
We will not risk our lives at all for lives or property already lost”.  
(Home Office 1998:11. Dynamic Management of Risk at Operational Incidents. Health and Safety – A Fire Service Guide)

The principal fires investigated within this report all too often identify the same underlying causes of firefighter fatalities even in very different settings as the fishbone analysis showed. The Venn diagram below provides another way of looking at the bigger picture across all the incidents. The root causes sometimes relate to failures of agencies beyond the control of FRSs, failures of government oversight and some major management failures within FRSs in the context of policies, procedures, practices, resources, staffing, training and so on.



The incident reports prepared by external bodies often identified effective solutions after painfully slow investigations, although sometimes missing institutional and policy causes that underlay the fatalities. All too frequently these solutions have not always been adopted or adopted fully and quickly enough. An analysis of brigade inspection and audit by internal and external bodies and regulation by external agencies indicates critical failures to ensure lessons were learnt from past firefighter at fire fatalities. Such bodies should ensure that effective defences in depth existed for firefighters in all brigades but they did not. Measures in place sometimes proved deficient for a variety of reason and failed to ensuring appropriate action by businesses, by local government and by regulators.

Firefighters themselves recognised many of the key failings that led to fatalities. Management and training were identified both in the literature produced by fire researchers and by several of the firefighters interviewed as a top issue with regard to the fatalities at fires. Incident command and control was another major concern linked to operational intelligence. The incidents in the report also reveal lethal failings by employers and businesses. What they do not reveal is a picture of over-regulation but the human costs to the firefighters, to the public and indeed to businesses of under-regulation.

Policy developments are often solely concerned with economic cases and frequently do not directly address the health and safety of firefighters or do so in the most superficial way. This gap between proposals about how fire services are run or should be run and the health, safety and wellbeing of those who will provide that service is a major cause for concern. Skewed cost benefit analyses can fail to assess the risks to those on the fireground – firefighters and public – and neglect detailed risk-benefit and hazard analyses. For example using more ‘on call firefighters’ may save income through reducing staffing budgets but it may also increase fatalities and injuries amongst on call and full-time fire fighters as well as the public and could increase property damage: sophisticated tools for modelling and assessing such impacts do not appear to have been applied in most such proposals.

The economic costs of failed systems to achieve interoperability appear to have been written off whereas lesser costs to the services that may benefit health and safety appear to be highlighted. Crewing changes may also have positive or negative effects. Resources, staffing equipment, planning, training, management and supervision may be factors too in firefighter fatalities as the earlier sections of this report discuss. Trying to ensure flexibility and local community responsiveness in frameworks may not sit well with effective responses to large fires across several FRS areas: the challenges of such efforts emerge with fires like the Atherstone warehouse and Buncefield. Nor may it necessarily work well with time and money spent on ‘red tape’ initiatives. For example the failed IT-based national FireControl Projects apparently cost £82 million (House of Commons Public Accounts Committee minutes 13<sup>th</sup> May 2013) although efforts to produce common SOPs and interoperability should improve firefighter health and safety.

A light Government touch on governance statements is not necessarily guaranteed to improve safety whilst trying to cut deficits and ensure resilience and its often under-researched or unknown consequences. Pooling too may not effectively meet any gaps identified especially in terms of staffing, resources and expertise (p14). Flexibility and resilience may not always compensate for staff and resources on the fireground and may have major health and safety implications for firefighters and the public. The latest report on the fire service, 'Facing the Future: Findings from the review of efficiencies and operations in fire and rescue authorities in England' by Ken Knight in 2013 (Knight 2013: 29) is again oriented towards cost savings and 'business cases' rather than health and safety (p29). Firefighter deaths and health and safety specifically are not mentioned at all and firefighter safety just once. Yet the report has major implications for firefighter health and safety and will or does indirectly impact on some of the recommendation relating to firefighter fatalities in the UK in the last ten years.

Whereas some CFOs have argued for integrating firefighter health and safety into all the fire service does, Knight's proposals effectively disaggregate it. There is no evidence-based consideration of the impact of the changes – for good or ill – or indeed any evidence provided, beyond a throw away comment that firefighters 'are much safer today' than they were (Knight 2013: 12). Firefighter fatalities do not bear out this picture and nor would occupational ill-health figures. Efficiency and quality of service to the public are the only topics that are stressed. Knight notes that "Firefighters themselves are also much safer today, even though they risk their lives to save the public" (p12) but does not explore the implications of his proposals on firefighter health and safety and the fatality figures over the last ten years are ignored. He observes that: "Deaths from fires in the home are at an all-time low; incidents have reduced by 40 per cent in the last decade, but expenditure and firefighter numbers remain broadly the same. This suggests that there is room for reconfiguration and efficiencies to better match the service to the current risk and response context" (Knight 2013:7).

Firefighter deaths in structural fires remain significant and have not dropped at rates that would have been expected. Reducing UK wide budgets and numbers of firefighters could lead to more deaths of both members of the public and firefighters. Firefighters deserve more protection not far less as is likely with government policies now under way.



# Fire Brigades Union

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