

**AGENDA MANAGEMENT SHEET**

<b>Name of Committee</b>	<b>Communities Overview And Scrutiny</b>
<b>Date of Committee</b>	<b>1st March 2011</b>
<b>Report Title</b>	<b>Fire Sprinkler Systems</b>
<b>Summary</b>	<p>The Fire and Rescue Service (FRS) in Warwickshire have made excellent progress over recent years in reducing the number of deaths and injuries from fire. Whilst the figures remain relatively low, there are few emergencies which can have such an immediate and major impact as a fire in a home, school, industrial premise or business. Fire can and does bring significant disruption to communities, the environment and the local economy. Fire sprinklers protect buildings; they protect the contents of buildings, reduce risk to the occupants and more critically they reduce risk to firefighters. Warwickshire Fire and Rescue Service now seek to promote the installation of fire sprinklers in residential premises, schools commercial and industrial premises.</p>
<b>For further information please contact:</b>	<p>Gary Phillips Deputy Chief Fire Officer Tel: 01925 423231 garyphillips@warwickshire.gov.uk</p>
<b>Would the recommended decision be contrary to the Budget and Policy Framework?</b>	<p>No.</p>
<b>Background papers</b>	<p>Building Research Establishment - Effectiveness of Sprinklers in Residential Premises <a href="http://www.bre.co.uk/filelibrary/rpts/sprinkler/sprinkler_exec_summary.pdf">http://www.bre.co.uk/filelibrary/rpts/sprinkler/sprinkler_exec_summary.pdf</a> And <a href="http://www.bre.co.uk/filelibrary/rpts/sprinkler/sprinkler_section2.pdf">http://www.bre.co.uk/filelibrary/rpts/sprinkler/sprinkler_section2.pdf</a></p> <p>Communities and Local Government - Provision of Sprinklers to Existing Residential Premises - The Preparation of a Regulatory Impact Assessment <a href="http://www.rmd.communities.gov.uk/project.asp?intProjectID=11790">http://www.rmd.communities.gov.uk/project.asp?intProjectID=11790</a></p> <p>East Ayrshire Council – Consultation on the Introduction of Automatic Life Safety Fire Suppression Systems within the Building Regulations</p>

<http://www.east-ayrshire.gov.uk/crpadmmin/agendas/dev%20serv/june%202004/consultation%20on%20the%20introduction%20of%20automatic%20life%20safety%20fire%20suppression%20systems.pdf>

Article - Fire Department Scottsdale - Saving Lives, Saving Money: Automatic Fire Sprinklers: A 10 Year Study

[http://findarticles.com/p/articles/mi\\_qa3737/is\\_200507/ai\\_n14823548/](http://findarticles.com/p/articles/mi_qa3737/is_200507/ai_n14823548/)

House of Commons Library – Sprinkler Systems in Schools Report 15<sup>th</sup> May 2009

<http://www.parliament.uk/commons/lib/research/briefings/snsc-05070.pdf>

National Assembly for Wales (Legislative Competence) (No7) Order 2008

<http://www.assemblywales.org/lco-ld6962-e.pdf?langoption=3&tll=LCO-LD6963%20-%20The%20National%20Assembly%20for%20Wales%20-%28Legislative%20Competence%29%20-%28Domestic%20Fire%20Safety%29%20Order%202008>

And

<http://www.assemblywales.org/lco-ld6962-em-e.pdf?langoption=3&tll=LCO-LD6963-EM%20-%20The%20National%20Assembly%20for%20Wales%20-%28Legislative%20Competence%29%20-%28Domestic%20Fire%20Safety%29%20Order%202008%20-%20Explanatory%20Memorandum>

National Fire Sprinkler Network – Minutes of Last Meeting

<http://www.nfsn.co.uk/meetings/2009/june/02-09%20NFSN%20Minutes%2004.06.08.pdf>

Copper Residential Sprinklers Systems for Life safety and Property Protection, Wiltshire Fire and Rescue Service

<http://www.copperinfo.co.uk/plumbing-heating-and-sprinklers/downloads/pub-147-copper-residential-sprinkler-systems.pdf>

Wiltshire Fire and Rescue Service Case Study – Residential Sprinklers Save House

<http://www.bckcontractingltd.co.uk/Wiltshire%20Fire%20Brigade%20Media%20Release.htm>

Local Government Association: Automatic Fire Sprinklers – A Guide for Domestic Properties

<http://www.lga.gov.uk/lga/aio/283729>

Local Government Association: Fire Sprinklers and Schools – A Survey of Fire and Rescue Services and Local Authorities 2008

<http://www.lga.gov.uk/lga/aio/814297>

Local Government Association: Automatic Fire Sprinklers – A Toolkit for Schools

<http://www.lga.gov.uk/lga/aio/283732>

Local Government Association: The Benefits of Automatic Water Suppression Systems – A Quick Guide for Councillors

<http://www.lga.gov.uk/lga/aio/1094744>

Department for Children, Schools and Families Building Bulletin 100: Design for Fire Safety in Schools

[http://www.teachernet.gov.uk/doc/12199/BuildingBulletin100\\_onlineversion.pdf](http://www.teachernet.gov.uk/doc/12199/BuildingBulletin100_onlineversion.pdf)

**CONSULTATION ALREADY UNDERTAKEN:-**

Details to be specified

- Other Committees  .....
- Local Member(s)
- Other Elected Members  Cllr John Whitehouse, Cllr Richard Chattaway,
- Cabinet Member  Cllr Richard Hobbs
- Chief Executive  .....
- Legal  Greta Needham
- Finance  Helen Murphy
- Other Chief Officers  .....
- District Councils  .....
- Health Authority  .....
- Police  .....
- Other Bodies/Individuals  .....

**FINAL DECISION NO**

**SUGGESTED NEXT STEPS:**

Details to be specified

- Further consideration by this Committee  .....
- To Council  .....
- To Cabinet
- To an O & S Committee  .....
- To an Area Committee  .....
- Further Consultation  .....

## Agenda No

# Communities Overview And Scrutiny - 1st March 2011.

## Fire Sprinkler Systems

### Report of the Chief Fire Officer

#### Recommendation

That the Communities Overview and Scrutiny Committee considers the report and resolves to support the Fire and Rescue Service in promoting Fire Sprinkler Systems

#### 1. Introduction

- 1.1 This report details information in relation to fire sprinklers and how Warwickshire Fire and Rescue Service (WFRS) is approaching the promotion of sprinklers in schools, residential, commercial and industrial premises.
- 1.2 Within the WFRS draft Service Plan 2011/12 three proposals have been made in relation to fire sprinklers:
  - (i) Work with building developers, district and borough councils and housing associations to help them understand the benefits of installing sprinklers in new homes across Warwickshire.
  - (ii) Encourage building developers to install sprinklers in new, large or high-risk industrial or commercial premises, that do not currently have sprinklers installed.
  - (iii) Make sure that sprinklers are installed in new or substantially refurbished schools in Warwickshire, in accordance with central government guidance.
- 1.3 There are few emergencies which can have such an immediate and major impact as a fire in a home, school, industrial premises or business. Fire can and does bring significant disruption to communities, the environment and the local economy.
- 1.4 It is believed that too few businesses appreciate the extent and cost of fires. Some indication of this can be seen from the fact that each year in the UK thousands of businesses are affected by fire. Where a business is the victim of a serious fire, the consequences can be very severe. Enforced closures while premises are rebuilt and moves made to temporary premises inevitably lead to a loss of customers, trade and employees. It may take years for businesses to regain their pre-fire trading levels and the local economy and community is impacted as a result. Research has shown that up to 80% of businesses which suffer a serious fire close-down within 18 months.

- 1.5 The cost of fire in residential buildings remains one of the largest contributors to the total economic cost of fire in the UK, accounting for 28% of the overall cost. The average cost of a domestic fire in the UK is estimated by Government at £25,000; of which approximately £14,600 is accounted for by the economic cost of injuries and fatalities, the remainder being property damage and the costs associated with the agencies involved in dealing with the fire i.e. the fire and rescue service, local authorities and police etc. In 2010, WFRS attended 239 dwelling fires which equates to approx £6Million.
- 1.6 Every year approximately 1,300 schools in the UK suffer from fires. Nationally school fires in the UK cost approximately £58 million per year. On average each school fire costs £44,000. Most school fires are started deliberately by young people. Sprinkler systems have great potential to help prevent the impact that a fire can have in a school. In March 2007, Jim Knight, The Minister of State for Schools and Learners, announced that it was the Department for Children Schools and Families (DCSF) expectation that all new schools will have sprinklers fitted, and exceptions to this would have to be justified by demonstrating that a school is low risk and that the use of sprinklers would not be good value for money.
- 1.7 There are many reported benefits associated with the installation of fire sprinklers: They protect buildings; they protect the contents of buildings; and they reduce risk to the occupants of buildings. They also reduce risk to firefighters: sprinklers detect and control fires when they are small, and activate an evacuation alarm. On this basis they frequently negate the need for firefighters to tackle, what would otherwise become large fires, or engage in hazardous search-and-rescue operations.
- 1.8 The installation of sprinkler systems also achieves environmental benefits. The volume of water needed for fire-fighting is reduced as is the run-off water from fire-fighting operations, which may contain chemicals. Firefighters often use 20 times more water from hoses to do the same job as a sprinkler. In tackling the Windsor Castle fire 7-million litres of water was used. As fire sprinklers limit fire size, the smoke and products of combustion from a fire are also reduced significantly. These can be a significant pollutant and cover wide areas of a community.

## **2. Evidence to support that the assertion that sprinkler systems have been proven to protect lives and prevent serious damage to property**

- 2.1 A number of reports have been produced on the subject of fire sprinklers. The issue has been under much debate in the UK because sprinklers offer a means of saving lives in commercial and industrial premises, schools and residential properties. However, a cost is attached to their installation. The key question raised within reports often appears to be: can a sprinkler system provide adequate fire control to allow escape and/or rescue at a reasonable cost?
- 2.2 The use of sprinklers in commercial and industrial buildings is now widely accepted in the UK and internationally. However, prior to 2004 there was a lack of information regarding the overall effectiveness of sprinklers in a residential setting. As a result the Government commissioned the Building Research

Establishment (BRE) to carry out a study to ascertain the effectiveness of sprinklers designed for installation and use in residential property.

- 2.3 The study reported that there was a strong correlation between the risks of death and injury per fire, and the ultimate fire size. This provided for an indirect indication of sprinkler effectiveness i.e. the larger the fire the more likely it was to kill or injure – sprinklers where fitted are shown to restrict fire growth, thus reducing this risk.
- 2.4 Estimates of sprinkler effectiveness at reducing deaths or injuries were made for residential categories of premises. The report makes the following observations in connection with the presence of sprinklers:
  - (i) Reduction in the number of deaths of 70% (+/- 15%)
  - (ii) Reduction in the number of injuries of 30% (+/- 15%)
  - (iii) Reduction in the number of rescues required of 35% (flats 50%) (+/- 15%)
  - (iv) Reduction in the average property damage of 50% (+/- 15%)
- 2.5 The report also reviewed other countries' experiences with domestic sprinklers and indicated that there was a reduction in deaths and injuries as a result of their use. However, the BRE report also identified that residential sprinklers were not always deemed to be cost effective for all types of residential buildings but were most cost effective for residential care homes, multi-storey blocks of flats or other premises whose structural characteristics or occupancy-type generated additional risk (it should be noted that, in terms of value-for-money, recent research conducted by Communities and Local Government (CLG) indicates the cost of sprinkler systems for a typical house have now been reduced significantly, to between £1000 and £2000 per house depending on water pressure (there is a requirement for a pump to be installed in low pressure areas) - this is thought to bring their use within affordability limits).
- 2.6 The BRE report outlined the results of practical tests comparing eight un-sprinklered and sprinklered lounge fires within two-storey detached houses of traditional construction. Sprinklers operated within 7-minutes from ignition, controlled all the fires and confined them to 30-50% of the item ignited first (for example a television set was used for test purposes). For un-sprinklered fires, the fire damage area was greater. The main conclusions from the practical tests were:
  - (i) With sprinklers, the fire gases were cooled sufficiently that the occupants of the room of origin of the fire would not have experienced extreme pain from the heat.
  - (ii) With sprinklers death would not have occurred.
  - (iii) Sprinklers would maintain tenable conditions throughout the house affected.
  - (iv) Without sprinklers the fire would eventually cause untenable conditions throughout the house.
  - (v) Sprinklers reduced convected heat from the fire.

- 2.7 Wiltshire Fire and Rescue Service successfully worked in partnership with local housing associations and planners in relation to the installation of fire sprinkler installations in 212 houses within an estate in Studley Green, Wiltshire. This is providing long lasting protection for a vulnerable community. Last year one fire on the estate was confined to the room of origin and damage was minor. Only one fire sprinkler activated. In this case, the smoke detectors in the house were inoperable and the fire started at 02.00 hours when all occupants were asleep.
- 2.8 The Fire Protection Association (FPA) reports that every year approximately 2000 schools in the UK suffer from fires. According to the latest estimates made by CLG there are 1,300 fires in schools per year where the fire and rescue service attends to extinguish the fire. This builds in significant costs related to the deployment of fire and rescue service assets and incurs direct costs related to building damage and injury by fire etc.
- 2.9 The research indicates that the cost of school fires is in the region of £58 million per year (2000-04 figures). Around 56% of school fires are started deliberately. It is reported that about one-third of arson attacks are carried out during school time, when children are at school. This trend is reported to be increasing.
- 2.10 The short-term effects of loss of facilities and equipment can be calculated, but the longer-term effects of loss of coursework and the disruption of classes are intangible and harder to quantify. However, a major fire is likely to disrupt a child's education for many months.
- 2.11 The Local Government Association (LGA) has published a leaflet titled; "The benefits of automatic water suppression systems – a quick guide for councillors". This contains interesting facts in connection with sprinkler systems. In addition, it outlines a three point plan for councillors, which includes recommending that councillors ensure: "Their council is following the DCSF risk assessment tool and policy which expects almost all new build and major refurbished schools are to be fitted with sprinkler systems". The LGA has adopted a lobbying stance with Government in seeking to extend and develop legislation in England which supports the wider use of sprinklers in buildings.
- 2.12 A report published by the National Fire Protection Association (NFPA) in 2007 concluded that in properties in the United States of America where sprinklers are fitted:
- (i) The death rate per fire is lower by at least 57%.
  - (ii) For most property uses, damage per fire is lower by one-third to two-thirds.
  - (iii) 89% of reported structure fires have flame damage confined to the room of origin, compared to 57% when no automatic extinguishing system is present.
- 2.13 Reportedly the most comprehensive study into the effectiveness of residential fire sprinklers to date was carried out by the Fire Department, Scottsdale, Arizona, USA. In 1997 a report was published titled: "Saving Lives, Saving Money: Automatic Fire Sprinklers: A 10 Year Study". This analysed the impact



of legislation enacted in 1985, which required all new residential flats and commercial structures built to be fitted with a fire sprinkler system, and all new single family residences built after 1 January 1986 to be able to accommodate fire sprinklers.

- 2.14 The Scottsdale study included a review of 109 fires that occurred in sprinklered structures, 44 of those being residential structures. In more than 90 percent of these incidents, one or two sprinkler heads controlled the fires, and the average amount of water used to suppress each fire was 209 gallons, compared to 3,290 gallons estimated for manual suppression in residential properties. It was considered that 8 lives were saved over the period as a direct result of the installation of fire sprinkler systems, 4 of these in residential properties, and that up to \$25.4m was saved based on the total potential loss due to fire in sprinklered residential properties.
- 2.15 Summary and general overview of facts and information about sprinklers from the British Automatic Fire Sprinkler Association (BAFSA):
- (i) There have been no multiple fire deaths in the UK as a result of a fire in a dwelling with a working sprinkler system.
  - (ii) US experience shows that 98% of all fires in sprinklered dwellings are extinguished with only one sprinkler head operating. The same data suggests that there is a 57% reduction in the likelihood of death for those in the room of origin.
  - (iii) Only the sprinkler heads in the immediate vicinity of the fire actually operate.
  - (iv) Sprinkler heads can be completely concealed.
  - (v) Sprinkler systems do not need pumps or tanks if mains pressure is adequate.
  - (vi) Sprinklered buildings prevent firefighter deaths.
  - (vii) Sprinklers do not 'false alarm' - they will only operate if there is an actual fire. There is only a 1 in 16,000,000 chance of 'false alarm' operation
  - (viii) For a small additional cost, an alarm switch can be built-in to the system to call the fire and rescue service automatically should the sprinklers operate.
  - (ix) Maintenance costs for sprinklers are very low.
  - (x) Sprinklers save lives - and property - and are the only devices which can detect a fire, sound the alarm, call the fire and rescue service and extinguish or control the fire.
  - (xi) Despite many preconceptions and misinformation, sprinklers are not difficult, unsightly or expensive to install in homes or dwellings of any size.
  - (xii) Since the UK started to take the idea of sprinklered homes seriously in the late 1990's, it has been estimated that 25 lives have already been saved by the systems.

- 2.16 Even where sprinklers are not required to be installed, there may be significant benefits for developers in seeking compliance with the standards detailed within the Building Regulations. For example; the installation of sprinklers can allow buildings to be built closer together (half the spacing is required where sprinklers are fitted) to adjoining premises. This is a major benefit for developers where site space is limited. Other requirements regarding travel distances for escape may also be extended and certain requirements in respect of access for the fire service may also be relaxed. Savings in construction and building cost related to the relaxation of certain fire protection measures and freedoms to allow 'open plan' design in three-storey dwellings and apartments can also be achieved where sprinklers are incorporated into a design.
- 2.17 In retail premises, sprinklers can be taken into account when calculating fire growth and smoke volume. This in turn allows the approval of longer distances of travel to exits which allows greater flexibility in the design of buildings.
- 2.18 For existing buildings the Regulatory Reform (Fire Safety) Order 2005 which replaced most existing fire legislation in England and Wales requires employers and others (the Responsible Person in the Order) to consider whether the duties imposed by the Order could be better discharged by fitting fixed fire suppression systems. The guidance documents published in support of the legislation recognise this. For example, residential care homes fitted with sprinkler protection can adopt a policy of delayed evacuation in the event of a fire alarm and the usual requirements to fit self-closers to all bedroom doors may be relaxed.
- 2.19 One of the most often ignored benefits of sprinklers is the additional flexibility which they provide to designers, developers and builders. In unconventional, unusual or historical buildings including sprinklers in a specification will often enable Building Regulations compliance to be achieved in a very cost-effective and sensitive manner. Where changes of building use are being anticipated, utilising sprinklers is often the only way in which means of escape requirements can be provided.
- 2.20 One of the most important advantages of a sprinkler system is that they can be at the centre of a Business Continuity Plan. They allow for a business to recover rapidly from a fire and restore full operations/services quickly. Recently a fire in tumble-dryer in a major entertainment complex in East Anglia was stopped from spreading by the activation of only one sprinkler head in a laundry building. As a result the laundry facility was operating again within three-hours. Without the sprinkler system serious disruption would have been inevitable.
- 2.21 Leaving aside the human casualties avoided, a major benefit of fitting a sprinkler system is reduced insurance cost. Zurich Municipal suggests sprinkler installation in schools could reduce their insurance premiums by around 75% per year, and lower the excess close to zero.

### **3. The statutory position in relation to the installation of sprinkler systems**

- 3.1 The Building Regulations 2006 (as amended) and approved documents accompanying the Regulations in England and Wales form the legislative

framework governing the installation of sprinklers in new buildings. These make specific reference to the use of sprinklers in buildings in England. The Regulations for Scotland, Wales and Northern Ireland differ slightly from those in England.

- 3.2 In England for life safety, new residential blocks over 30m high must be fitted with sprinklers to meet Building Regulations Approved Document B standards. Similarly an uncomparted area in a shop or self-storage building over 2000 square metres now requires sprinkler protection. There are corresponding regulations applying to large single storey buildings for industrial or storage use where the largest permitted un-sprinklered compartment is 20,000 square metres. There is a strong belief within the Fire and Rescue Service nationally that the large compartment sizes specified within the Building Regulations for the provision of sprinklers, in warehouses in particular, creates significant risks for firefighters in dealing with large un-compartmented building fires where no sprinklers are fitted – This is particularly pertinent to Warwickshire Fire and Rescue Service because this is the type of building where four firefighters died in Atherstone-on-Stour.
- 3.3 In connection with residential sprinkler systems no statutory provision is made in England at present within the Building Regulations other than the requirement for installation in new flats over 30m in height. Sprinklers are not presently required in new hotels and guest houses despite the risk to life associated with sleeping accommodation. At present the Government has no plans to review the Building Regulations in England until 2013. It is for this reason that the LGA and fire and rescue service is lobbying for a change to the Building Regulations.
- 3.4 Despite the absence of legislation, the use of sprinklers is growing. Small businesses operating for example as hotels or bed and breakfasts are themselves increasingly using domestic sprinklers as opposed to the more complex commercial installations to compensate for or to avoid the requirement to carry out works to improve structural fire safety arrangements which may detract from the use of the premises or require significant structural alterations with related costs etc.
- 3.5 The installation of sprinklers in schools is not mandatory at present. However, DCSF introduced a policy on sprinkler systems in schools in March 2007. This reinforced the need for sprinklers in schools from the earlier policy position. DCSF now reports that it expects the majority of new state-funded schools to be fitted with sprinkler systems. However, the decision to install sprinklers should be based on a risk analysis of the particular school concerned. To help local authorities and design teams assess the level of risk and make the right decisions, DCSF has developed two practical aids: a simple fire risk assessment tool to assess the need for sprinklers in the proposed school building; and a spreadsheet based cost benefit analysis tool to help users decide whether sprinklers represent good value for money.
- 3.6 Despite the publication of the most recent DCSF policy, research conducted in 2008 by the British Automatic Fire Sprinkler Association (BAFSA) for the LGA reports that 24% of local authorities have no informal or formal policy position on the installation of sprinklers in schools.
- 3.7 Nationally, of the first seven schools built under the Building Schools for the Future programme, only one (Bristol Brunei Academy) was fitted with a

sprinkler system, although five of the remaining six were refurbishment projects.

#### 4. Data in relation to the number and operation of sprinkler systems installed in premises

- 4.1 CLG maintain fire statistics for all fire and rescue services. Table 1 below details the extent to which sprinkler systems (all types and property groups) have been involved in controlling fires in England over a three-year period to 2008. This shows how sprinklers work effectively on all but a small number of occasions (44 occasions where the system did not control or contain the fire for 1508 fires).
- 4.2 Where Table 1 indicates that sprinklers did not operate, this in general is as a result of the following reasons; the temperature in the area of the sprinkler heads was not sufficient for activation of the sprinkler system; the fire was in another part of the building and away from the sprinkler system; the fire self-extinguished before it grew large enough to operate the sprinkler; the occupier noticed the fire and extinguished this before it became large enough to operate the sprinkler.

Year & Sprinkler Operation		Fires
<b>2005</b>	<b>Total</b>	<b>515</b>
	Operated and extinguished fire	83
	Operated and contained/controlled fire	119
	Operated but did not contain/control fire	18
	Did not operate	295
	Unspecified	0
<b>2006</b>	<b>Total</b>	<b>466</b>
	Operated and extinguished fire	74
	Operated and contained/controlled fire	133
	Operated but did not contain/control fire	10
	Did not operate	249
	Unspecified	0
<b>2007</b>	<b>Total</b>	<b>527</b>
	Operated and extinguished fire	85
	Operated and contained/controlled fire	163
	Operated but did not contain/control fire	16
	Did not operate	263
	Unspecified	0

**Table 1: Sprinkler System Operation 2005, 2006 and 2007.**

## **5. Key features of sprinkler systems**

- 5.1 All areas of the building to be protected are covered by a grid of pipes with sprinkler heads fitted into them at regular intervals. Water from a tank via pumps or from the service (town) main (if it can give enough flow) fills the pipes.
- 5.2 Each sprinkler head operates only when it reaches its predetermined operating temperature and will then spray water onto a fire. The hot gases from a fire are usually enough to make the thermal element in the head operate. Only the sprinklers in the immediate area of the fire open. The others remain closed. This ensures that no water is applied to areas where there is no fire and reduces the amount of water needed.
- 5.3 The sprinkler heads are spaced, generally on the ceiling, so that if one or more operate there is always sufficient flow of water. The flow is calculated so that there is always enough to control a fire taking into account the size and construction of the building and the goods stored in it or its use.
- 5.4 Sprinkler heads can be placed in enclosed roof spaces and into floor ducts to protect areas where fires can start unnoticed. In a large warehouse sprinklers may be placed within the storage racks as well as the roof. Sprinkler heads are designed to evenly distribute water from the sprinkler pipework in a spray pattern onto the fire in the most efficient manner. Sprinkler heads are in general small and neat and where required, can be made to blend in with the décor. They are available with a range of finishes and colours and in some cases can be completely concealed.
- 5.5 At the point where the water enters the sprinkler system there is a valve. This can be used to shut off the system for maintenance. For safety reasons it is kept locked open and only authorised persons should be able to close it. If a sprinkler head opens and water flows through the valve it lets water into another pipe that causes a mechanical gong to sound. In this way, the sprinkler system generates an alarm at the same time as controlling or extinguishing the fire. Modern sprinkler systems are linked into a buildings fire alarm system and can be connected by telephone to a remote monitoring station.
- 5.6 The pipework may be concealed or left exposed depending on the type of building and use i.e. industrial buildings and warehouses – pipework is often left exposed and in residential property such as a home or bed and breakfast this is normally concealed within the ceiling. Pipework can be in copper, steel or in CPVC (chlorinated polyvinyl chloride), which is not expensive and easy to fit.
- 5.7 Most rooms in a house only require one or at most two sprinkler heads to afford complete protection. However, in a large compartment i.e. a warehouse, many sprinkler heads may be required depending on the nature of the building and fire loading of the stored contents.
- 5.8 While there are a range of different types of sprinkler systems used in a range of premises it is considered that only wet systems (permanently charged with water) should be specified in domestic premises. These systems are the simplest, easiest to maintain and are also the most cost effective.

## **6. Engagement with central government in lobbying for installation of sprinklers in a wide range of buildings**

- 6.1 As a result of property loss over the years and the death of firefighters across the Country there have been a series of campaigns, petitions and lobbying by the fire and rescue service nationally to try and make the installation of fire sprinkler systems in a range of commercial and industrial buildings a mandatory requirement. WFRS is actively engaged in support of this campaign.
- 6.2 In England, Lord Harrison of Chester has introduced two Private Members Bills in the House of Lords related to domestic sprinklers. This is supported by the Chief Fire Officers Association (CFOA) of which senior managers in WFRS are active members. The Bill has received a second reading on the 22<sup>nd</sup> October 2010 and has been committed to a committee of the whole house.

## **7. Progress in other Countries in Great Britain in introducing a Statutory Duty for installation of sprinklers in all new houses**

- 7.1 The Welsh Assembly is considering a Legislative Competence Order (LCO) which if enacted would require the installation of sprinklers in a wide range of new dwellings. The proposed new law which would compel house builders to fit fire sprinklers into new homes built in Wales has been backed by the National Assembly following a four month enquiry in which evidence was heard from the fire service, house builders and representatives the water industry. The legislation is currently passing through the Assembly and it is hoped it will be enacted soon.
- 7.2 This Order is fully supported by the three fire and rescue services in Wales and fire and rescue services in England, as well as the Fire Brigades Union, the Fire Industry Association and the various professional bodies associated with sprinkler design and installation.
- 7.3 The Welsh LCO comes after changes to legislation made in Scotland in May 2005 which now requires the installation of sprinklers in all new care homes, sheltered housing and high-rise residential accommodation above 18 metres high. In addition, sprinklers are now required in all covered shopping centres.

## **8. What WFRS will do to promote the use of fire Sprinklers**

- 8.1 WFRS will work with approved installers for domestic fire sprinklers with a view to supporting the installation of systems. As installations need to be properly designed and fitted by accredited installers WFRS will also be working with suppliers to help them to meet professional and technical standards and to better understand the principles around fire safety in buildings. The service's role in this area will be primarily to seek the adherence to agreed standards and to identify opportunities for developers and installers to work in partnership on the installation of systems.
- 8.2 WFRS will seek to enter into partnership with all local authorities in Warwickshire which will be aimed at encouraging the installation of sprinklers in Houses in Multiple Occupation (HMO).

- 8.3 WFRS is formally consulted by local authorities prior to any significant building development being approved by them. During consultations Fire Safety Officers ensure that where it is believed sprinklers may have a positive impact in reducing risk, they proactively liaise with Building Control Officers and developers to communicate the benefits of sprinklers.
- 8.4 In 2011/12 WFRS intends to visit all district and borough councils' Planning Committees in Warwickshire to discuss plans to promote the installation of sprinklers in schools, commercial, industrial properties and homes. These visits will be part of a wider consultation and communications exercise designed to raise awareness for the benefits fire sprinklers have and to discuss opportunities to use Section 106 arrangements and planning conditions to influence the installation of sprinklers in appropriate residential and other buildings. In this respect, regard is being had for the creation of MoU with local authorities, which lay out the criteria for the installation of sprinklers as part of the planning process in Warwickshire. Here, the installation of sprinklers may be used to compensate for extended travel time from a fire station, particularly in rural areas or to mitigate the risk in social housing or HMO etc.
- 8.5 Partnerships will be established where possible with Housing Associations in Warwickshire. The aim is too influence and create a willingness to consider the installation of domestic sprinkler systems in new social housing at construction stage.
- 8.6 Where plans for new housing developments are presented to the Service for consultation, every effort will be made to influence local authorities and the developers, particularly of social housing and client Housing Associations to consider the installation of sprinklers.

## **9. Creation of a register of buildings with sprinkler systems installed in Warwickshire**

- 9.1 Currently there is no formal register of buildings in Warwickshire where sprinklers have been installed. However, performance information regarding sprinklers is to be collected to help establish a database showing their location and the type fitted as part of the work WFRS is now doing in this area.
- 9.2 Sprinkler systems are normally designed with an audible alarm. An automatic connection to a premises fire alarm panel and central monitoring station is also more common in modern buildings. When the sprinkler system activates the alarm is sounded. The alarm is normally located to provide both a warning to occupants inside a building and also to passers by. This ensures that the alarm is raised even when the premises are not occupied. It also acts to make firefighters aware of the operation and presence of a sprinkler system in a building, which influences their approach to tackling the incident.
- 9.3 When firefighters conduct risk information gathering visits to higher risk buildings in Warwickshire, they record details of a buildings structure, internal layout, contents and the presence of fire-fighting installations such as sprinklers. This information is captured in the form of a plan, which is held centrally and at local fire stations. This helps firefighters identify the high risk

buildings in an area and locate fire-fighting installations such as sprinklers where installed.

- 9.4 Commercial buildings fitted with sprinkler systems normally have an external marker plate located adjacent to the sprinkler alarm. This identifies the presence of sprinklers inside a building.
- 9.5 Sprinkler systems can play an important and valuable role in meeting the safety needs of vulnerable people and marginalised groups. Effectively, where fire risk is highest in Warwickshire will determine the priority for the installation of sprinklers

## **10. Maintenance of Fire Sprinkler systems**

- 10.1 Generally in the United Kingdom, sprinkler systems are designed to BS EN 12845 and BS 9251. There are times where specific insurers or customers also require systems to be designed and installed to comply with other international standards, such as NFPA (USA standards) or Factory Mutual (FM Global - insurance company) requirements.
- 10.2 Sprinklers are installed to industry agreed standards. Certification schemes are supported by government, fire authorities, BAFSA, insurers and the Confederation of British Industry (CBI). This provides for an enhanced level of quality assured sprinkler protection which is delivered through specifying minimum requirements for installers and includes the number of experienced design staff required, appropriate training for fitters and sub-contractors, use of listed equipment and the ability to provide an adequate maintenance service.
- 10.3 On completion of a sprinkler installation, a Certificate of Conformity will be issued by the installer. A copy of this is kept on the premises where the system has been installed and made available for inspection by fire authorities and insurance companies. A further copy of the Certificate is held by the accreditation scheme which maintains a master reference for all certificated installations.
- 10.4 At regular intervals, surveillance visits are carried out by the members of the scheme. These ensure that approved companies are complying with agreed minimum standards and include the inspection of completed installations and installers' premises.
- 10.5 To make sure that a sprinkler installation will work it must be properly designed and installed. There are presently two independently accredited organisations which undertake the certification of sprinkler installers. WFRS will be recommending that developers and partner organisations select systems installers who are accredited and will be working with these organisations to promote their ongoing technical development and use.
- 10.6 Where Fire Safety Officers visit premises as part of the WFRS fire safety risk based audit and inspection programme of buildings they will be looking for evidence that sprinkler systems meet agreed standards and are serviceable.

## **11. Recommendations**

- 11.1 That the Committee acknowledges the evidence to support Warwickshire Fire and Rescue Service's claims, that sprinkler systems have been proven to protect lives and prevent serious damage to property.



- 11.2 That the Committee note the current statutory position in relation to the installation of sprinkler systems.
- 11.3 That the Committee consider supporting lobbying activity aimed at introducing a statutory requirement for the installation of sprinkler systems in all new homes in England.
- 11.4 That the Committee consider supporting lobbying activity aimed at reducing the compartment size in large single storey buildings used for storage, beyond which sprinklers are mandatory
- 11.5 That, in the absence of a current programme for legislative change, the Committee consider supporting WFRS in:
- (i) Working with building developers, district and borough councils and housing associations to help them understand the benefits of installing sprinklers in new homes across Warwickshire.
  - (ii) Encouraging building developers to install sprinklers in new, large or high-risk industrial or commercial premises that do not currently have sprinklers installed.
  - (iii) Making sure that sprinklers are installed in new or substantially refurbished schools in Warwickshire, in accordance with central government guidance.
- 11.6 That the Committee note the key features of sprinkler systems
- 11.7 That the Committee consider supporting the approach being taken by WFRS, in developing a register of building fitted with sprinkler systems in Warwickshire.
- 11.8 That the Committee consider the appropriateness of WFRS approach in targeting installation of sprinkler systems at the most vulnerable.
- 11.9 That the Committee consider the efficacy of arrangements used to promote the effective maintenance of sprinkler systems, once installed.

## **Glossary**

APB – Arson Prevention Bureau

BAFSA – British Automatic Fire Sprinkler Association

BS – British Standard

BRE – Building Research Establishment

CBI - Confederation of British Industry

CFOA – Chief Fire Officers Association

CLG – Communities and Local Government

CYP – Children and Young People

DCSF – Department for Children, Schools and Families

FPA – Fire Protection Association

HMO - Houses in Multiple Occupancy

LCO - Legislative Competence Order

LGA – Local Government Association  
NFPA – National Fire Protection Association

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