sprinkler focus



IN THIS ISSUE

Comprehensive review of Sprinkler Saves

When designed, installed ^{compr}of & maintained to standard, sprinklers will protect our citizens and our cities from fire



British Automatic Fire Sprinkler Association



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BAFSA FOCUS MAY 2022

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When designed, installed & maintained to standard, sprinklers will protect our citizens and our cities from fire

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WE DO NOW seem to be coming out of the pandemic and after the periods of lockdown, we are now returning to a "new normal" with one of the most notable events being Fire Sprinkler International 2022, hosted jointly by BAFSA and EFSN.

Like our previous joint events this is an opportunity for the UK and European sprinkler industries to get together to showcase the latest developments in our

sprinkler industry. I am delighted that we will be joined by likeminded members of the sprinkler industry from around the world, many of our visitors will also be speaking at the conference and showcasing all that is great about automatic fire sprinklers and why they have been so successful for the last one hundred and fifty years.

The FSI 2022 is a celebration the fantastic developments for sprinklers from across the globe.

Within the UK and Europe, we are seeing many developments using water-based suppression systems, however it is equally important that we continue to ensure that all these products are manufactured and installed to the rigorous standards which have made sprinklers such a positive and reliable success since 1872.

BAFSA only allows Third Party Accredited Installers to join its Membership and relies on the accreditation bodies to ensure that these standards are achieved in order to get accreditation and maintain these rigorous standards thereafter. It is clear from the number of companies gaining Third Party Certification with FIRAS, LPCB and IFC that this message is getting across.

However, there remains a problem that many customers are specifying approved British and European Standards for installation but are not specifying that the installing company is Third Party Accredited, this is a matter that BAFSA will continue to lobby for.

Following Fire Sprinkler International, BAFSA will return to our normal programme of sprinkler presentations throughout the UK and we look forward to meeting up with you at these events.

Keith

Keith MacGillivray MBE MA BSc **Chief Executive** BAFSA



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Sprinkler FOCUS is the biannual magazine of the British Automatic Fire Sprinkler Association. It is the only UK publication which has automatic fire sprinklers at its core with current news, features and opinions along with case studies and product updates.

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From the sprinkler head

A ROUND-UP OF NEWS FROM BAFSA & ITS MEMBERS

All good things must come to an end

Since its formation in 1974, BAFSA has been instrumental in recruiting several highly influential people to its Team, both from the sprinkler industries, education and the Fire and Rescue Services.

This year will see the retirement of one of these Team Members.

lan Gough has been a Senior Member of the BAFSA Team for almost twenty years and throughout that time has worked tirelessly to promote the use of automatic fire sprinklers in industrial, retail, and domestic properties.

lan has always been involved in the extinguishment of fires in one way or another, he served in West Midlands Fire Service, Leicestershire Fire Service and Northamptonshire Fire and Rescue Service from where he retired after thirty-one years as a Senior Fire Safety Officer.

During his time in the fire service lan was a member of the working groups preparing guidance for: factories, warehouses and residential care properties in England and Wales covered by the Regulatory Reform (Fire Safety) Order 2005; and has been a member of the Loss Prevention Council (Fire & Security) Board. He has acted as an 'expert witness' in several cases relating to fires and the enforcement of the Fire Safety Order.

Drawing on over 31 years of experience in firefighting operations, fire safety and fire investigation, Ian has lectured at the Fire Service College, and has written a number of articles on fire safety - especially fire sprinklers in large single-storey warehouses



Following his retirement from the fire service Ian joined BAFSA and has been their Senior Technical Advisor on sprinklers. During his time with BAFSA he has been extremely influential in promoting the use of sprinklers in all types of properties and risks.

Working with Ann Jones, Ronnie King and the late Bernadette Hartley, they led a campaign in Wales for the installation of automatic fire sprinklers in housing following a number of very serious multi fatality fires in dwellings.

As a Member of the Welsh Assembly Ann was able to introduce a private members bill which led to sprinklers becoming a requirement in new built homes in Wales through the Domestic Fire Safety (Wales) Measure 2011 which came into force in 2013.

lan also carried out considerable work in promoting the use of sprinklers in car stackers which were involved in several serious fires in 2005-2015.

lan has produced numerous papers on the benefits of the use of automatic fire sprinklers throughout industry and commerce and has been a well-known figure on the lecture circuit promoting the use of sprinklers for the last twenty years.

We would like to wish Ian and Cheryl a very long and happy retirement.

BAFSA GOLF TOURNAMENT & CHALLENGE DAY 30th June, Mottram Hall

This day of sporting rivalry, team building and general merriment is back. All the action will happen outside in the beautiful surroundings of Mottram Hall with a giant teepee serving as our teams' HQ for the day as well our venue for the barbecue and prizegiving.

Teams of 10 will compete in 9 disciplines ranging from laser clay pigeon shooting to humansheep herding to giant jenga, cornhole, and of course the annual BAFSA quiz.

The aim of the day is to gather BAFSA members and their guests together to meet, renew old friendships (rivalry), make new friends (and sum up the competition), get to know colleagues and the industry with one eye on the BAFSA Challenge trophies and prizes and without one eye on the order book.

11 Sponsored Challenge Teams are now lined up and preparing to do battle: Applications Engineering, Clarke Fire Protection Products, Domestic Sprinklers, Fire-Mech, Grundfos, Hall & Kay FE, Johnson Controls, Rapidrop, Viking, Vipond, Writech

Sign up now at bafsa.org.uk

Sprinktec

Scottish Qualification Award

The Domestic and Residential sprinkler courses offered by Sprinktec have been accepted as a customised Award through the SQA (Scottish Qualification Award). These awards will be listed with an SCQF Level of 7 and will have 9 credit points. The courses are:

- Unit 1 Domestic and Residential Fire sprinkler design.
- Unit 2 Domestic and residential (commercial) Sprinkler design

These courses have been developed to help the domestic and residential market gain a better understanding of the new rules and are run over one-week virtual classroom conditions and the candidates must also submit course work.

The course work is checked by independent verifiers, each with over 20 years design experience in the sprinkler industry (covering both Domestic and Commercial systems).



Fire Sprinkler International

If you intend attending FSI 2022 you will have the opportunity to visit these 16 BAFSA members' stands

Viking Reliable **Johnson Controls** Victaulic Partners& **EM Global Clarke Fire Protection Products** Potter Electric Signal Rapidrop SIKA **Applications Engineering** Marioff **Armstrong Fluid CST International** The Fire Protection Association Sprinktec



From the sprinkler head

A ROUND-UP OF NEWS FROM BAFSA & ITS MEMBERS



Fire Protection Association

The value of independent inspection

The FPA publishes sound advice online (https://bit.ly/3FPTFRo) on independent fire sprinkler system inspections confirming that they are the most effective and safest way to help maintain a sprinkler system, as outlined in the LPC Rules for Automatic Sprinklers. Automatic fire sprinkler systems are known to be an extremely effective way of controlling the spread of fire, but like all systems, they must be serviced and maintained.

Sprinkler systems are designed to suit a range of hazard classifications. If alterations are made to the building layout, storage arrangements or processes, for example, this could have a major impact on the current sprinkler system's performance.

Due to the importance of service and maintenance, an annual service is a requirement, and has been documented in the BS EN 12845 where it states that: "The sprinkler system should be periodically inspected at least once a year by a third party."

Additionally, the commentary and recommendations in the LPC Rules for Automatic Sprinkler Installations 2015, TB203.2.4.1. also states that inspections have to be undertaken by an independent third party.

Systems cannot be inspected by:

- The system's owner
- The building's occupier
- The system's installer
- The service and maintenance provider
- Insurance companies for their commercial and underwriting purposes

The Fire Protection Association is an independent body within the fire protection market and can offer inspection services in accordance with best practice guidelines.

The piece advises that a comprehensive system review should include:

- A full system assessment
- An assessment of whether the system coverage is adequate
- A visual inspection of the age and condition of the system
- A review of hazards including inspection of processes and storage arrangements
- The witnessing of water supply tests
- A check to see if the pump and tank systems operate as designed
- A check to see if the system is linked to an alarm system that operates when a flow test is conducted
- A check that the system valve sets are secured open and clearly labelled
- A review of the current testing regime
- A full report with any impact analysis and practical guidance if improvements are needed.

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From the sprinkler head

A ROUND-UP OF NEWS FROM BAFSA & ITS MEMBERS

New venture – gas suppression division

Armstrong Priestley are excited to announce the arrival of Adrian Poole who has joined the company to head up their new Fire Suppression division. This move enables Armstrong Priestley to offer their clients a full turnkey solution for every type of fire risk, from fire sprinklers to gas suppression for high value asset protection and critical environments such as data suits, IT mainframes, robotics, electrical installations and control rooms etc.



New Members

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BAFSA is pleased to introduce the following new members:

- A D Sprinklers
- Alpine Fire Ltd
- Residential Fire Protection Ltd
- Electrical Plumbing & Gas Supplies Ltd
- Base Fire Sprinklers
- Harrijess Ltd

Celebrating 40 years of engineering excellence and innovation



Aquatech Pressmain has been supplying their high quality, reliable and innovative water booster sets and pressurisation units for industrial, commercial and domestic buildings for 40 years. The company started in 1982 as "Aquatech Limited" out of a need for the servicing company Acorn, to manufacture and supply packaged pump sets, specialist control panels and controls. They quickly became established as a market leader in microprocessor controls. In 2006 Aquatech Limited bought Pressmain Pressurisation and Warmac becoming "Aquatech Pressmain". Manufacturing products in their Essex factory to ensure the water flows in all sectors from health care to hospitality; care homes to banks; palaces to universities; supermarkets to dentists; as well as homes throughout the UK and abroad. Well-known clients include: Carlsberg, Harris Tweed and The University of Kent. With over 100 loyal staff, it is still family run with family values and a reputation for carefully designed products and 24/7 support from highly trained, experienced Service Engineers.

Looking to the future, there are many exciting new products in development for pressure boosting, pressurisation and fire sectors, together with new advanced intelligent controls packages, aimed at making Aquatech Pressmain the greenest, most efficient, and reliable on the market.



Writech acquires Compco

Compco Fire Systems has joined Writech Fire Group (Writech), one of the UK and Ireland's largest specialist fire protection engineering companies.

Founded in 1988 and employing over 200 people, Compco is the UK's largest privately owned fire-engineering company offering a wide range of services to all sectors and has grown from its Worcester Head Office to a further six offices across the UK.

Welcoming the announcement, Ted Wright, CEO of Wtech Fire Group, said:

"Compco is a great business supported by a team of excellent people. Its purchase represents the continued realisation of our strategy to grow our UK business and strengthen our position as a leader in fire protection systems. We are very excited about the future prospects for the business and look forward to working with the team to build on their successes to date." sprinkler head A ROUND-UP OF NEWS FROM

From the

voltages, currents, powers, PF and all the parameters that give a clear indication of the pumping system status. All settings for the voltage and current sensors are made via parameter programming, and commissioning/ maintenance is made easy by dedicated display pages. The main features are common to both electric and diesel pump controllers, allowing perfect integration of the two systems, with less wiring, fewer components and less programming to set up the system.

SEP MD, Rob Bell comments, "The Lovato Fire Pump Controller is a great fit for our already extensive and high-quality product range and meets the needs of our discerning customers. We're regularly asked to quote for replacement and new pump controllers, and have sometimes struggled to get a reliable and top-quality product which is also costeffective. Quite simply it's a win-win offering. We are proud to offer our customers another top-quality product."

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Mark Castle joins as part of a £9m investment deal

As part of a £9m investment into Triangle Fire System by capital investor BGF, Mark Castle has joined the company as a non-executive chairman.

The investment from BGF will enable Triangle Fire Systems to expand its team of 100 specially trained staff and establish new service lines. The business will also look to pursue a targeted buy and build strategy to complement its organic growth.

Colin Chantler, CEO at Triangle Fire Systems said: "We are delighted to announce the new funding from BGF and the appointment of Mark Castle to the board. The investment, alongside Mark's unparalleled experience will help us grow our reach and expand our services across the residential and commercial property market.

Dates for your diary

30th June

BAFSA Golf tournament and the BAFSA Challenge Day, Mottram Hall

3rd November

BAFSA AGM and dinner, Marriott Forest of Arden hotel. For priority reservations for the dinner email marketing@bafsa.org.uk



FM & VdS approved land pump

Marioff, a leading developer of water mist fire protection technology, has launched the new core of its land fire protection systems: the Marioff HI-FOG® Land Pump Unit (LPU). The pump's efficiency, space-saving modularity and easy-to-maintain design make the pump costefficient during its lifecycle.

The new LPU has received FM and VdS Approval after full-scale product tests and it includes all the functionalities the HI-FOG system requires for land applications.

The LPU is designed to work together with HI-FOG 3000 sprinklers, making the total HI-FOG water mist solution highly efficient. In most cases, the required pump size can be optimised to fit each designed HI-FOG system and customer need, resulting in cost and space savings.

The new LPU has a new PLC-based pump controller and an intuitive user interface. A touch screen displays a system log and status, alarms, and other important data clearly. Customers can download log files and share with Marioff for further analysis, making remote troubleshooting uncomplicated. As new features are developed continuously, the control system has been built with updates in mind.

The LPU is quick to install in different kinds of pump rooms due to its compact size, which fits onto a pallet and it's not just the compact size and modularity that allow for easy installation. The pump unit can also be adapted to suit the electrical system of the building.

The modular design makes the manufacturing of the unit fast and decreases lead times for deliveries and simplifies maintenance routines.





Fire pump controllers

SEP have been appointed distributors for the high-functioning electric and diesel Fire Pump Controllers from Lovato.

Lovato's FFL...EP (electric pump) and FFL.. DP (diesel pump) controllers integrate all necessary features required by EN12845 standard. They also meet the requirements of the ISO 9001 standard (as do SEP), as well as ISO 14001, ISO 50001 and ISO 45001.

With simple and intuitive operation, a display screen, LEDs, pushbuttons and a backlit graphic LCD display it's visually and functionally attractive. The display provides

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ON 6TH SEPTEMBER 1993 a fire occurred at a poultry processing factory in Hereford owned by Sun Valley Poultry, which was at the time the largest employer in the county. Tragically, during firefighting operations, two firefighters, Leading firefighter John Davies and firefighter David Morris, lost their lives.

Nearly three decades later, have all lessons been learnt?



ASKS IAN GOUGH, TECHNICAL ADVISER, BAFSA

IN THE WAKE of the Grenfell tragedy much has been written and spoken about the fire risks posed by modern methods of construction and, in particular, combustible building panels. However, the many warning signs of problems associated with 'sandwich' panels (sometimes known as LISPS i.e., Large Insulated Sandwich Panels) and their behaviour in fires were there to see a long time ago in both residential and commercial buildings. Two particularly notable fires being the Sun Valley Poultry factory fire and the Atherstone Food Processing plant fire. Interestingly, a closer study of many of these fires reveals that not all of the problems could be specifically related purely to combustible core panels, but it was this feature where the majority of attention was certainly focussed; other issues were either missed or deliberately ignored.

A chance meeting and conversation with a now retired fire officer who, coincidentally like me, began his career as a fireman at the same fire station in the West Midlands, revealed that having subsequently moved to rural Herefordshire on his transfer to the Hereford and Worcester Fire Brigade, he had attended the Sun Valley factory fire.

THE SUN VALLEY FIRE

He also confided that, because of refurbishment and alterations to the property a few years before the fire, when approval was sought for Building Regulations' consent, colleagues tried to ensure that the building was fitted with sprinklers. Sadly, as is so often the case, these recommendations fell on the deaf ears of building control and managers alike.

We ended our all too brief conversation, each slightly more knowledgeable about this fire but both pondering if, despite the huge outrage caused by Grenfell and the fire safety standards in flats, so much has really improved regarding industrial premises – including the safety of firefighters who are expected to enter them.

THE SUN VALLEY FIRE

On 6th September 1993 a fire occurred at the Sun Valley Poultry factory in Hereford. The company processed chicken and other poultry products for food outlets and supermarkets and was the largest employer in the county. It employed approximately 500 workers at what was then known as the Corbett Block. Tragically, during firefighting operations, two firefighters, Leading firefighter John Davies and firefighter David Morris, lost their lives.

The building in question was a large single-storey factory that had originally been erected in the 1980s and was a composite of earlier structures which had been modified and extended. The overall footprint covered an area of approximately 19,000m2. This was therefore a very large industrial building.

It was predominantly steel framed with brick or block outer walls surmounted by an insulated steel roof. However, the majority of the building was internally lined and insulated (both walls and ceiling) with a combination of polystyrene and polyurethane foam sandwich panels, plus some mineral fibre panels providing a degree of fire protection above a cooking area. It is important to note that the ceiling panels were suspended by steel wires and plastic fittings that would easily fail when subjected to heat.

Modern food production areas require easy to clean hygienic surfaces and an ability to maintain and regulate workplace temperatures, so the development of lightweight insulated panels has been a significant contributor to overall food safety standards. The number of cases of food poisoning significantly increased in the 1980s and early 1990s and hence the demand for these panels grew exponentially. Indeed, it has to be conceded that such products have probably saved many lives as the latest Government statistics (2020) show that 180 people died from food poisoning in the UK whereas only 44 persons died in fires in buildings other than dwellings during the same period.

But, of course, these advantages should not have blinded us to the risks these materials and products pose when a fire occurs.

On the day of the major fire at Sun Valley, a 'radio frequency defroster', with a history of previous faults causing small fires, was seen to be glowing 'red hot' with flames issuing above the unit at sometime between 1125 and 1142 in the morning. Workers sounded the alarm, called 999 and attempted to tackle the fire with three carbon dioxide extinguishers. The building was evacuated and a satisfactory roll call taken in approximately 5 minutes with everyone accounted for.

Within two minutes of the call to "a fire in the roof space", the first fire appliance arrived at 1146 and a team of two firefighters entered the building and began fighting the fire. However, as the fire continued to develop in one corner of the building, additional resources were summoned.

At shortly after mid-day the decision was taken to send firefighters to the other end of the building to gain access there, and see what could be done to ensure the fire didn't spread further through the production area. It is a key principle of firefighting that fires should be 'surrounded' in order to efficiently extinguish them.

At 1225, the internal conditions around this secondary area of operations were reported as being very good, with very minimal sign of fire or smell of smoke. Indeed, conditions being as clear as they were, there was some discussion as to whether the use of breathing



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🚺 SCAN ME

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apparatus (BA) would be necessary but the decision was taken to use BA, just as a precautionary measure.

Leading firefighter Davies and firefighter Morris were briefed to carry out a reconnaissance of the main compartment and, if possible, to check the roof space. They were not expected to do anything other than observe and report back so they were unencumbered by any firefighting equipment such as a hose-reel and simply carried handheld radios.

Unfortunately, no one at the time realised that the roof space, lacking any fire compartmentation or ventilation, was heavily involved in fire and the situation was rapidly worsening.

Having travelled less than 20 metres from the exit door into the building, the two firefighters reported that visibility was clear with no obvious signs of fire. Good radio communications were being maintained. But suddenly, just 10 minutes after entering the building, a distress message was sent by one of the firefighters indicating they were in serious trouble. Fire and Rescue Service personnel outside immediately sent a rescue team into the building but they had to withdraw. Not only were the conditions now very hot, but the ceiling had collapsed, bringing with it a considerable amount of metalwork and ducting which, in turn, physically trapped the two casualties.

Despite heroic attempts by five further BA teams of firefighters to rescue their colleagues, all personnel were withdrawn to safety when a number of explosions and further collapse of structure occurred. Consequently, the Chief Fire Officer who by now was at the scene, made the very difficult decision to prohibit anyone from re-entering the building until the fire was fully under control. Sadly, it was later that evening when the bodies of Leading firefighter Davies and firefighter Morris were finally recovered.

Fire crews remained onsite for a further six days, however, the building was eventually totally demolished.

THE AFTERMATH

The coroner's inquest returned an open verdict and it was decided that the accident that caused the deaths probably resulted 'from a catastrophic collapse of the roof'.

As one would expect, the Health & Safety Executive (HSE) conducted an investigation into the fatal injuries sustained by John Davies and David Morris and in 1994 Hereford and Worcester Fire Brigade were served with two improvement notices from the HSE:

- (i) That the information held by the Brigade and available to fire crews and officers on particular hazards is insufficient to ensure the health and safety of firefighters. (This particularly addressed the lack of detailed Risk Information) and
- (ii) That Breathing Apparatus training was not sufficient to guarantee the Health and Safety of Firefighters.

However, no other formal enquiry or subsequent report was ever published regarding this major fire.

Indeed, apart from recommendations to check on the location of buildings where sandwich panels might be fitted, very little advice was given to fire brigades. It was mainly the efforts of Hereford and Worcester Fire & Rescue Service and others such as Rockwool Ltd and responsible insurers to educate fire officers about the risks associated with sandwich panel construction. Even then, people were very guarded in what they divulged for fear of trespassing into areas where lawyers were active in the litigation processes.

Eventually, Cargill Foods, the US Multinational parent company of Sun Valley admitted total liability and accepted the payment of damages to the widows of John Davies and David Morris. However, no proceedings were taken against the Company under any criminal laws such as the Health & Safety at Work Act.

The Government responded with the then Department of Transport and Regions (DETR) updating the 1992 edition of Approved Document B to the Building Regulations with guidance on 'Fire Behaviour of Insulating Core Panels Used for Internal Structures' (but not until the year 2000!). This can be found in Appendix F of the Approved Document B and interestingly two of the design recommendations are:

- Providing a fire suppression system for the risk
- Providing a fire suppression system for the enclosure.

Finally, in an attempt to improve the standards of installation of panels, a certification scheme together with a system of labelling the different types of panels was introduced by International Fire Consultants Ltd. However, it seems that there has been little appetite for the schemes and only limited take-up.

ISSUES MISSED OR IGNORED

As previously mentioned, there was never any formal in-depth enquiry or report following this tragedy and, because of the inevitable lengthy legal processes, it took some time for good information to emerge. However, from the facts that were eventually revealed it is clear that further scrutiny of the circumstances surrounding this fire should have taken place.

Large hidden cavity not sub-divided

The building clearly had a massive roof void that was not divided by cavity barriers. This was contrary to Regulation B3 (4) of the Building Regulations 1991, relevant at that time, that states:

"The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited".

This matter strangely received little or no attention.

The actions of the fire and rescue service certainly received close attention by the Health & Safety Executive. This must be expected and is necessary. However, there is no evidence that anyone questioned Building Control on this matter.

Not just linings but walls and ceilings were the fuel

Regulations have existed for many years to try and ensure that fires do not spread rapidly inside a building by virtue of inappropriate wall and ceiling linings. Regulation B2 of the Building Regulations 1991 is worth noting:

B2. (1) To inhibit the spread of fire within the building, the internal linings shall—

(a) adequately resist the spread of flame over their surfaces; and(b) have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.

(2) In this paragraph "internal linings" means the materials or products used in lining any partition, wall, ceiling or other internal structure

At Sun Valley clearly there were walls and ceilings formed of materials that significantly propagated and spread the fire. Accepting that those drafting the regulations were thinking of other fires, where flames had spread across the surface of a wall – hence the worry about 'linings'; but it is surely pure semantics to focus on the word



linings and not appreciate the structure itself is potentially more dangerous than any coat of gloss paint could be.

Large non-compartmented industrial building without sprinklers

The Corbett Block building was very large. The Building Regulations (B3 (3) require that buildings are compartmented:

"to an extent appropriate to the size and intended use of the building".

What is considered appropriate may be found in a table published in the Approved Document B. However, despite changes introduced in 2006 to limit the size for storage buildings unless sprinklers are fitted, there is still no limitation on the size of a single-storey industrial building. This surely is a major flaw in the guidance and it needs to change if the public expects firefighters to enter and tackle fires in large factories.

No means to ventilate smoke and hot gasses to aid firefighting and rescue

It may be speculative, however, if the roof failed at Sun Valley in the early stages of the fire (as is so often the case in industrial fires) and allowed the fire to vent, the outcome could have been quite different.

Fire ventilation has been a key tactic used by firefighters for centuries. Indeed, it is an important means by which firefighters might enter a building in some degree of safety. There is no specific regulation that covers this matter except that Regulation B5 of the 1991 Regulations - 'Access and Facilities for the Fire and Rescue Service' - states that "reasonable facilities" shall be provided to assist firefighters in the protection of life. However, in the appropriate section of the Approved Document B in section 18 is a chapter titled 'Venting of Heat and Smoke from Basements'. There is no indication that there might be a need to ventilate other parts of a building such as an enclosed roof space.

This is perhaps another example where the principles behind the actual 'regulation' is being missed or forgotten as building professionals slavishly follow the guidance.

CONCLUSION

Following the Atherstone fire in 2007, where four firefighters lost their lives, two junior officers from Warwickshire Fire and Rescue Service were prosecuted for manslaughter. Manslaughter carries a maximum penalty of 'life imprisonment'. Five weeks into the trial at Stafford Crown Court the judge acquitted the two officers. Meanwhile the Health and Safety Executive had again been quickly issuing 'improvement notices' on the Fire and Rescue Authority. No other 'authority having jurisdiction' appears to have been criticised - despite the fact that building inspectors apparently visited the premises eighteen times before the fire.

Recently, in relation to the Grenfell Enquiry, Matt Wrack of the Fire Brigade's Union noted that, whereas London Fire Brigade Officers had been subjected to over two months of questioning by lawyers for the Enquiry, only two weeks were taken to scrutinise the actions of the numerous politicians that included four 'fire ministers' responsible for failing to implement the recommendations of the coroner after the Lakanal House tragedy. Building standards and fire safety were not considered being sufficiently important.

Anyone involved in the supervision of fire safety staff in local authority fire brigades from the mid 1980s onwards will recall how often it was emphasised by government officials, Home Office Inspectors etc that the 'lead authority' in building matters was building control and not the fire service. This is the clear statutory position and has been accepted by fire and rescue services. With this in mind, following any disastrous fire, it is high time that the focus changed a little and included the scrutiny of organisations other than the fire service who have a clear legal responsibility for the safety and welfare of persons in and around buildings at all times.



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24 Hour Battery Backup

The specified AGM rechargeable battery provides the system with a 24hr battery backup in the event of a mains power failure.

Audible Alarm

A distinguishable audible alarm in the event of a sprinkler activation or fault on the system.

Tank Level Alarms

Monitors low levels of water within a sprinkler or combined tank to raise an alarm indicating in a failure of the water supply.

Monitor System Components

As well as monitoring flow switches, FloWatch 9251 can monitor all the required fault conditions detailed in BS9251:2021 table 5.

Pump Fault Monitoring

FloWatch has dedicated inputs for pump fault monitoring, giving early detection if a fault should occur.

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View the system status remotely via web browser, tablet or mobile device and receive email and text alerts in the event of an alarm.

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Not always the solution



I'VE NEVER FOUND A COPY OF FOCUS IN A DENTIST'S WAITING ROOM, SO IF YOU ARE READING THIS MAGAZINE, YOU ALREADY PROBABLY KNOW THAT AUTOMATIC WATER SUPPRESSION SYSTEMS ARE EFFECTIVE AND EFFICIENT WRITES RITCHIE O'CONNELL BAFSA ADVISER IN WALES.

OVER MANY YEARS BAFSA and other organisations have tried to promulgate the wider use of sprinkler systems in particular.

This has led in some quarters to accusations that we (the sprinkler industry/ sprinkler lobby/ church of the automatic water suppression system) believe "*sprinklers to be a panacea…*" this is definitely not the case, to the best of my knowledge no-one has ever actually claimed this, it's a good soundbite though, so it is often repeated!

In reality we in the sprinkler industry and the wider fire safety industry are conscious that both active and passive fire protection measures are necessary to form part of a whole fire safety package. Although I will admit to a personal belief that most fire safety solutions would benefit from the inclusion of a well-designed, installed, commissioned and maintained sprinkler system. The evidence supports that belief.

However the burgeoning acceptance of sprinklers as part of a fire safety solution at a time when fire engineering or performance-based solutions for smaller projects - even into the domestic market are becoming more widespread. Recently, I have come across a number of scenarios where the provision of an automatic water suppression system as part of a 'fire engineered solution' have amounted to nothing more than an ill-conceived notion which made no impact on a potentially dangerous situation.

In each of these instances, which were all sleeping risks, had I still been a serving fire and rescue service officer the situations were sufficiently grave to have warranted a prohibition notice, I would also have recommended action against the person who 'designed' the system and the person who installed it (there was no commissioning or they'd be in the frame too).

On each occasion the scenario was the same a sleeping risk which constituted a high risk to life, and fell outside current guidance. Consistently there were one or more bedrooms for which the only escape route would be compromised by a fire before persons asleep in the bedrooms could make their escape, the situations varied slightly with building height, open plan vs inner room scenarios, egress through higher risk rooms etc all being issues. The Responsible Person had, in good faith, taken the advice of an 'expert(s)' who identified the risk but assured them that the provision of a sprinkler system, or on one occasion a water mist system, would constitute a fire engineered solution and would remedy the problem.

Ironically, on each occasion a properly designed system would in all likelihood have at least provided the basis for a robust solution

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and with a few additional passive and active fire safety provisions would have delivered a safe and complaint solution.

The expert(s) had then 'designed' the so-called system stipulating how many heads and their locations and the Responsible Person(s) had found a local company who had installed to the expert's design.

Fast forward some years and yours truly was asked to carry out fire risk assessments on the premises involved. The solutions were quite simply not solutions at all, the positioning of the heads was bizarre in one example the sprinkler heads were fitted only in the escape stairwell with no heads or detection fitted in the rooms, whilst there was fire loading in the rooms there was none in the stairwell, the phrase which springs to mind is "as much use as an ashtray on a motorbike".

Another example which comes to mind was the provision of a system which could not be serviced, as no one knew what it was! (mist/sprinkler/ water filled balloon?) It was fitted in a ground floor kitchen to compensate for the fact that the only escape route from the bedrooms was via the kitchen, the nozzle/head was positioned to cover the only risk which the expert had perceived in this scenario, that of a cooking fire. The 'solution' missed a number of pertinent points, for example the kitchen was an inner room with a further access room to be negotiated and within this second access room was a very large open fire without so much as a fire guard (a chocolate fire guard would have been as robust a solution as that implemented by the 'expert')so there was a high risk of a fire occurring in the room adjacent to the nozzle/head.

Whilst it is alarming that people purporting to have sufficient knowledge to draft a fire engineered solution clearly do not have said knowledge, but do not allow this trivial point to stop them providing and charging for such solutions, it is equally disturbing that in different parts of the country the Responsible Persons were able to find 'suppression companies' to fit the Heath Robinson/ Wallace and Gromit systems proposed.

I am pleased to say that none of these ill-imagined systems have been fitted by BAFSA members and that on several occasions BAFSA members when asked to service such systems have demurred. In each case providing the client with reports identifying the shortfalls in the current provision and making recommendations for addressing the issue.

We know all too well that there are those who, had one of these Wallace and Gromit systems failed, would gleefully have jumped on a "sprinkler system failure!" We already understand that sprinklers or water mist can enhance fire safety in most scenarios, we must however continue to get the message across to the purchasers, specifiers and end users of these systems, as well as to the general public that such systems must be designed installed commissioned and maintained to the appropriate standards.



Put a firefighter in every room INSTALL SPRINKLERS

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Sprinkler Saves UK Annual Review 2021/2022

Summary

This review has been produced for information purposes to raise awareness of the importance of collating sprinkler saves from across the United Kingdom. A sprinkler save is where one or more sprinkler heads activate containing, controlling or in some case extinguishing a building fire. The story around the incident provides powerful evidence as to the ability of sprinklers to reduce the effects of fire.

The review uses information collated from 53 fire incidents, during financial year ending March 2022, in which sprinklers and other Automatic Fire Suppression Systems (AFSS) were reported as having an impact. The reported incidents span a wide range of building types and occupancies.

The information is for the incidents that were reported. In the prior three years across Great Britain¹ there were on average 200 incidents per year in which the operation of sprinklers was reported within the incident reporting systems for the Fire and Rescue Services.

About The British Automatic Fire Sprinkler Association (BAFSA)

BAFSA is the UK's leading professional trade association for the fire sprinkler industry, our primary objectives include providing authoritative information on the benefits of fire sprinkler systems and how fire sprinklers can play a significant role in saving life and property from the devastating effects of fire. To this end, BAFSA works closely with the government, Fire and Rescue Service (FRS) building control officers, insurers, architects, and town planners.

Our Vision

Fires are adverse events. They are destructive, with their knock-on effects including their toxic and corrosive effects of smoke and the environmental effects of fire water from firefighting operations.

The Sprinkler Saves UK Website is hosted and coordinated by BAFSA supported by the National Fire Chiefs Council, National Fire Sprinkler Network and Business Sprinkler Alliance.

We want to enhance protection against fire through the increased acceptance and use of

fire sprinklers. We do this by encouraging and promoting the installation of sprinklers and other forms of AFSS driving a culture change so that they are understood and accepted as the norm for the United Kingdom.

One way to achieve this is by working with our FRS representatives, sprinkler industry colleagues to collate sprinkler activations. The details of the incidents provide further evidence of their reliability and effectiveness of sprinkler systems in containing, controlling, and extinguishing fires, preventing fire damage. Promoting these activations via the sprinkler saves website, social media and other communication channels.

There is clear evidence that fire sprinklers can be effective in the rapid suppression of fires preventing flashover and can therefore play an important role in achieving a range of benefits for both individuals and the community in general.

They also provide environmental benefits, reducing fire loss, damage to the environment, reducing carbon emissions and reducing the use of water from the resulting firefighting operations preventing expensive restoration of buildings, replacing expensive equipment, plant machinery.

It is anticipated year on year the number of reported sprinkler saves will increase due to:

- The increased use of automatic fire suppression in the built environment across the UK.
- In England, recent changes in regulatory guidance for the installation of sprinklers in high rise residential premises reducing the building height at which sprinklers are guided to 11m.
- The rise of retrofitting projects in large scale residential properties, due to the focused attention on fire safety in the aftermath of the tragic Grenfell Tower fire.
- We will stimulate growth in reporting through:
 - the appointment of a designated sprinkler saves coordinators.
 - the increased communication of the reporting saves via multiple channels
 - the publication of reports that will provide a detailed analysis of compound data on fire incidents in Great Britain where sprinklers are identified as present or activated.

Nick Coleshill Coordinates the Sprinkler Saves Website for BAFSA, any questions or enquires can be submitted to nick.coleshill@bafsa.org.uk

Previous sprinkler saves promoted, reported to BAFSA from 2013/14 onwards can be found in the BAFSA yearbook publications available to download at www.bafsa.org.uk

Review

This review is split into three sections:



Highlighting a sample of sprinkler save case studies by calendar month, uploaded on to the sprinkler saves website. Identifying/ promoting the many ways fire sprinklers and other AFSS protect lives and property on a daily basis.

2. Part B

Interrogating information, data captured, submitted from 53 reported fires where fire sprinklers and other forms of AFSS operated.

3. Part C

Incident data reports, focusing on fire sprinklers over the period 2018/19 to 20/21, how to report a sprinkler saves.

Part A - Collation of Monthly Sprinkler Case Studies

A sprinkler save has been chosen for each calendar month for the 12-month period ending March 2022 focusing on a variety of buildings, occupancies, types of fires.

1. April 2021; Hostel Fire

- Occupancy; Hostel
- Where, Southend on Sea
- When; 9 April 2021
- Fire Rescue Service; Essex County Fire & Rescue Service (ECFRS)
- Time of Call; 10:17
- AFSS; Sprinklers

The benefits of sprinklers were clearly demonstrated following a fire involving a hostel which was contained controlled within the room of origin. One fire sprinkler head actuated suppressing the fire, final extinguishment was completed using a hose reel jet, and no injuries were reported.

The installation of sprinklers at this Hostel was made possible by a grant from ECFRS. The grant was part of their Think Sprinkler Strategy. The Service has pledged £250,000 to help make sure that the homes where the most vulnerable people live are protected by fire sprinkler systems.

2. May 2021; Waste Site/Recycling Centre, Lithium Battery Fire

- Occupancy; Waste Site/Recycling Centre
- Where, Manchester
- When; 7 May 2021
- Fire Rescue Service; Greater Manchester Fire &
- Rescue Service (GMFRS)
- Time of Call; 13:02
- AFSS; Sprinklers

FRS attend around 300 significant fires in waste sites each year. Fires in waste sites are often difficult to extinguish, requiring considerable resources for long periods, and can have serious effects on public health, the environment, safety to firefighters and local communities

3 pumping appliances were mobilised to the fire, on their arrival it was established that a dry pipe fire sprinkler system had operated in the warehouse loading bay. Twenty fire sprinkler heads were activated, which contained/controlled the fire located in the warehouse loading bay before the arrival of operational crews.

This type of AFSS brings considerable benefits for this type of business. They are fast-acting, immediately suppress the fire upon actuation, keep the fire under control before major damage is caused to buildings and equipment.

- Minimising financial losses incurred from having to replace damaged goods, plant, and machinery
- Reduces the down time of the business following the fire
- Protecting firefighters

The benefit of business continuity clearly identified as the business interruption was minimised to 3 hours. The cause of the fire was attributed to a lithium-ion battery igniting waste.



3. June 2021; Kitchen, Chip Pan Fire

- Occupancy: Purpose Built Block of Flats, 10 or more storeys-
- Where, Flint
- When; 3 June 2021
- Fire Rescue Service; North Wales Fire & Rescue Service (NWFRS)
- Time of Call; 17:42
- AFSS; Sprinklers

In 2016 working closely with NWFRS, Flintshire County Council took the bold decision to review their fire safety arrangements to protect their most vulnerable residents by retrofitting fire sprinklers to all three of their specialised housing high-rise blocks.

This event clearly demonstrates the continued benefits of that decision. Fire sprinklers operated following a kitchen flat fire involving a chip pan which had been accidentally left unattended.

Firefighters identified that a sidewall fire sprinkler head had operated in in a flat where the fire originated, extinguishing the fire before their arrival. The benefit of the residential fire sprinkler system was clear to see as the kitchen sustained minor smoke damage.

Lee Williams, Deputy Head of Business Fire Safety at North Wales Fire and Rescue Service, said: "This incident clearly highlights the importance of sprinklers in helping to avoid the spread of fire.

"The fast activation of the sprinkler system helped to protect the occupier of the flat from serious harm, as well as avoiding severe damage to his flat and major disruption to the remainder of the building and its occupants which may have resulted had the fire spread."

This is the second sprinkler save at this location following an event in January 2020. Again, the incident was centred on a fire within a kitchen. The fire was extinguished quickly by the fire sprinkler system with damage confined to a cooker unit. These two incidents clearly identify the benefits of retrofitting high-rise purpose-built block of flats with fire sprinklers.

4. July 2021; Bin/Refuse Room, Fire

- Occupancy: Purpose Built Block of Flats, 10 or more storeys¬
- Where, Stockport
- When; 7 July 2021
- Fire Rescue Service; Greater Manchester Fire & Rescue Service (GMFRS)
- Time of Call; 00:23
- AFSS; Sprinklers

One fire sprinkler head activated containing/ controlling the fire before the arrival of GMFRS,

two fire appliances attended the incident extinguishing the fire with one hose reel jet

It should be noted that the outcome of a communal bin store fire can have a dramatic effect on the safety of the residents. This is particularly apparent where refuse chutes and access hatches can sometimes be found directly opening onto protected corridors, lobbies, and stairs, so providing the potential for the spread of fire and smoke to the common escape routes.

- It is therefore best practice in these situations: 1. Bespoke sprinkler system, Further protection
- can be provided by the installation of a fire sprinkler system located over the refuse bins with either frangible bulb or fusible link fire sprinkler heads, or open fire sprinkler heads with water discharge controlled by smoke detectors. The provision of fire sprinklers should always be considered where access hatches open into protected stairways or lobbies containing more than two flat entrance doors.
- Automatic fire-resisting shutter should be fitted at the base of the refuse chute to restrict the spread of fire and smoke from a fire in the bin/ refuse room. The shutter should, as a minimum, be operated on a fixed temperature fusible link.

Housing providers across the country are recognising the danger of these type of fires, London Borough Barking & Dagenham in 2014/15 for example, reduced the risk by the retrofitting of sprinklers into all their high-rise residential block bin stores

5. August 2021; Candle Fire

- Occupancy: Purpose Built Block of Flats, 10 or more storeys-
- Where, Isle of Dogs
- When; 17 August 2021
- Fire Rescue Service; London Fire Brigade (LFB)
- Time of Call; 14:03
- AFSS; Sprinklers

LFB were called to a high-rise fire on the 37-storey, two residential fire sprinkler heads operated containing/controlling the fire and limiting its impact with fire damage contained within the flat preventing flash over. Firefighters were able to identify and locate the sprinkler isolation valve minimising water egress.

Fire crews from Poplar, Shadwell, Bethnal Green, and Plaistow attended the incident. The fire originated from an unattended candle and was under control by 14:37pm.

Tower Hamlets Borough Commander Richard Tapp said:

"The sprinkler suppression system made a big difference in containing the fire and limiting its impact.

"A number of people evacuated from the fire floor before firefighters arrived. Other residents remained in their unaffected flats. The firefighters that attended worked quickly and the vast majority of residents were back inside their flats within an hour of the first call.

"Sprinklers are the only fire safety system that detects a fire, suppresses a fire and raises the alarm.

"They save lives and protect property and they are especially important where there are vulnerable residents who would find it difficult to escape, like those with mobility problems."



New Providence Wharf fire – a fire without sprinklers

On the May 7th, 2021, LFB attended a high-rise residential fire at New Providence Wharf which started in a consumer unit in an 8th floor flat. The fire proceeded to travel out of an open balcony window. At the same time smoke poured into the corridor through a flat door that had accidentally been kept open.

A report has been released by the LFB identifying a serious failure of a smoke ventilation system that resulted in the building acting like a "broken chimney" left residents' only escape route smoke logged.

It was identified that the building was not fitted with a residential fire sprinkler system, would the outcome of been different if sprinklers had been fitted. Containing/controlling the fire or even extinguishing the fire before the arrival of the fire rescue service?

6. September 2021; Residential, Cigarette Fire

- Occupancy: Purpose Built Block of Flats
- Where, High Wycombe District
- When; 28 September2021
- Fire Rescue Service; Buckinghamshire Fire and Rescue Service (BFRS)
- AFSS; Personal Protection System Unit (PPS)

This fire involved the actuation of a PPS unit. In the early hours the resident woke up to smoke a cigarette, accidentally the lit cigarette dropped onto the floor causing their slippers to catch light.

Sufficient smoke was generated to activate the PPS unit to discharge, alerting the resident to the fire and who was able the vacate the property before the arrival of the FRS. No injuries were reported.

To satisfy the FRS, the product chosen was certified to LPS 1655 (LPCB Third Party Approval Standard). The importance of a third-party approval standard should not be underestimated for fire protection systems as it provides confidence about their design, performance, and reliability in practice. A business case has recently been accepted by The British Standards Institution for a British Standard for PPS.

Person-Centred Fire Risk Assessment/Risk Profile

This incident identifies the importance of identifying those residents that are most vulnerable from fire by the completion of personcentred fire risk assessment. This is likely to be completed in premises where the risk to persons in a fire situation is increased due to cognitive or mobility impairments.

A typical risk profile for the installation of a PPS would be a person who, because of mental and/or physical health issues spends the majority of their time in either a bed or chair and who would be unable to easily escape in the event of a fire. They do not provide building protection and should not be used in lieu of other building protection systems.

Care needs to be taken to ensure that the risk profile of the vulnerable person is appropriate for PPS. For example, a vulnerable person who is mobile and living in a multi roomed flat has the potential to be affected by a fire anywhere in their home.

As a result, they would possibly require the installation of a AFSS (such as a sprinkler system that is designed, installed, and maintained to BS9251:2021 'Fire sprinkler systems for domestic and residential occupancies' providing full coverage.

Further guidance on the use of deployment and limitations of local application watermist systems can be found in the publication prepared by BRE Global in partnership with London Fire Brigade'Guidance on the use, deployment and limitations of Personal protection watermist systems in the homes of vulnerable people'.

7. October 2021; Shopping Centre, Electrical Fire

- Occupancy: Shopping Centre
- Where, Stratford
- When; 17 October 2021
- Time of call; 10:03
- Fire Rescue Service; London Fire Brigade (LFB)

LFB were called to an electrical fire within a first floor retail unit, resulting in the shopping centre being evacuated with no injuries reported.

The commercial fire sprinkler system activated controlling/containing the fire before the arrival of operational crews who extinguished the fire using two jets. It should be noted fire sprinklers control the size of the fire, reducing the amount of heat, smoke generated.

In shopping centres, it is common practice to protect the commercial unit/shop unit with fire sprinklers to contain the fire. Fire sprinklers are not normally installed in the malls due to limited combustible load in these zones.

Fires have significant impact on business continuity which can lead to business closures



and environmental impacts and require major FRS resources.

This was clearly demonstrated at a fire that occurred in July 2019 at the Walthamstow Mall resulting in over 20 fire appliances and in excess of 110 firefighters attending the incident. The shopping centre remained closed for two months with the damaged portion of the mall reopening in October 2020.

Shopping centres are complex buildings that often include a variety of uses within them; leisure areas, hotels, apartments, cinemas and offices. Therefore, retail centres require a high standard of management compared to other building uses. This vitally extends to ensuring the premises fire safety systems are operable in the event of a fire including fire sprinklers, fire alarm system, dry/wet risers, smoke extraction units and fire curtains

To highlight this, LFB published an open letter² in 2020, to those responsible for fire safety in shopping centres. Highlighting the importance of maintaining fire safety systems including the premises fire sprinkler system.

8. November; 2021 Primary School Fire

- Occupancy: School
- Where, Swindon
- When; 22 November 2021
- Time of call; 13:46
- Fire Rescue Service; Dorset and Wiltshire Fire Rescue Service (DWFRS)
- AFSS; Sprinklers

The benefits of installing fire sprinklers in schools was clearly demonstrated following a fire discovered within a toilet and cloakroom area of this school. The cause of the fire involved the ignition of a toilet roll and its plastic holder resulting in one fire sprinkler head to activate, extinguishing the fire, and limiting smoke and heat damage.

On arrival firefighters identified that the fire has been completely extinguished by the fire sprinkler system and proceeded to assist the school in isolating the system. Business continuity is paramount following any operational incident, to return a system to operation and the business of education in the case of this school to continue without further interruption.

When you compare this to a previous serious school fire at Avenue Primary School in Warminster attended by DWFRS in January 2017. On arrival operational crews found a well-developed fire within a classroom block. Fire sprinklers were not fitted, the damage was extensive, but crews were able to stop the spread of fire to further school buildings.



Dorset & Wiltshire Fire and Rescue Service, like all fire rescue services continue to urge, lobby local education and environmental leaders to install school sprinkler installations.

It is not mandatory for new schools in England to be fitted with fire sprinklers which is already the case in Wales since 2014 and Scotland since 2010. Despite a growing acceptance amongst the public, and some politicians of the value of fire sprinklers, there is a continuing reluctance to fit sprinklers in new schools in England.

9. December 2021; Warehouse Fire

- Occupancy: Warehouse
- Where, Gateshead, Tyne and Wear
- When; 17 December 2021
- Time of call; 11:57
- Fire Rescue Service; Tyne & Wear Fire Rescue Service (TWFRS)
- AFSS; Sprinklers

A fire involving a propane gas-powered forklift truck involving several wooden pallets was extinguished by the actuation of three fire sprinkler heads prior to the arrival of fire crews, preventing further fire damage.

The fire occurred in the storage warehouse distribution area with fire crews mobilised from TWFRS.

Without the commercial fire sprinkler system, there would have been significant damage to the business, potential risk of injury to members of staff and firefighters due to the involvement of the propane gas-powered forklift truck. The effect of which would have accelerated the fire allowing it to spread rapidly to the combustible materials located in proximity of the fire.

This incident clearly demonstrates the benefits of business continuity by the installation of fire sprinklers in warehouse premises turning what could be a major incident into a minor inconvenience. Demonstrating fire sprinklers are the most effective way of:

- Protecting business from fire
- · Business interruption from fire is minimised
- · Ensuring jobs are not needlessly lost
- Local community, environment is protected
- Protecting firefighters
- Demonstrating that warehouse fires can be contained and extinguished.





10. January 2021; Tumble Dryer Residential Care Home Fire

- Occupancy: Residential Care Home
- Where, Wellingborough
- When; 27 January 2022
- Fire Rescue Service; Northamptonshire Fire and Rescue Service (NFRS)
- AFSS; Sprinklers

A fire involving an industrial tumble dryer located in the laundry room on the ground floor was contained by the residential fire sprinkler system.

One fire sprinkler head actuated suppressing the fire before the arrival of NFRS who extinguished the fire with two hose reel jets.

The benefits of business continuity clearly demonstrated with no smoke or fire damage to the surroundings or in close proximity to the tumble dryer appliance.

The benefits of installing a fire sprinkler system clearly demonstrated.

- Fire was contained to the room of origin, preventing flash over
- Staff provided with extra time to implement the premises emergency action plan (Progressive Horizontal Evacuation) allowing residents nearest to the fire to be evacuated to a place of safety.

The safety of firefighters reinforced, providing time for operational crews to implement their tactical action plan.

Following the tragic events of The Rosepark Care Home Fire in Uddingston, South Lanarkshire in 2004 that sadly killed 14 residents, Scotland responded by making the installation of sprinklers mandatory in all new care homes. Unfortunately, in England there is no requirement for the installation of fire sprinklers to protect the most vulnerable residents from fire.

If England had followed the lead of Scotland making the installation of fire sprinklers mandatory in new care homes, would the tragic fire at Newgrange Care Home, Hertfordshire been avoided?

Unfortunately, 2 residents died with 33 residents rescued in an accidental electrical blaze in April 2017. Following the incident, the coroner formally raised concerns in his prevention of future death report to the then Secretary of State Michael Grove, that "Sprinkler systems are not a mandatory requirement for care homes whose occupants have either limited or no independent mobility and are therefore at higher risk from fire"



Newgrange care home fire Credit: Hertfordshire Fire & Rescue Service

11. February 2022; Electric Bike Fire

- Occupancy: Purpose built block of flats, 10 or more storeys
- Where, Chester
- When; 28 February 2021
- Time of Call; 00:32
- Fire Rescue Service; Cheshire Fire and Rescue Service (CFRS)

A fire involving an electric bike on charge was extinguished by the actuation of the residential fire sprinkler system with one fire sprinkler head operating.

CFRS have reported in a press release that the fire started after midnight on February 28 when the occupier was sound asleep in a flat. He was woken to the fire sprinkler head above the bike spraying water in the room. A smoke alarm activated in the flat and the man was able to escape to safety.

Two fire engines attended the scene at 12:32am and although the sprinkler had extinguished the fire the crews removed the battery from the bike to the safety of outside as a precaution.

12. March 2022; Shopping, Residential and Leisure Complex, Fire

- Occupancy: Restaurant
- Where, Liverpool
- When; 29 March 2022
- Fire Rescue Service; Merseyside Fire and Rescue Service
- AFSS; Sprinklers

A fire contributed to an electrical fault was successfully extinguished by the commercial fire sprinkler system. One fast response fire sprinkler head actuated, raising the alarm and no injuries were reported.

This incident clearly identifies the importance of installing fire sprinklers as part of a holistic approach for fire safety and the benefits for



Restaurant fire Credit: JJFire ENG

continuity of operations. The images clearly identify the fire was contained/controlled with minimal heat or smoke damage within the restaurant, resulting in minimal impact to the business.

The inclusion of a commercial fire sprinkler system has been proven to: -

- Prevent major financial loss to the business hospitality community
- Preventing a potential major incident and reducing it to only a minor inconvenience

Reporting Fire Sprinkler Activations, Moving forward

- To influence change, we need evidence, data, therefore we require your continued support, reporting fire sprinkler activations for all fires, large or small
- We welcome sprinkler save reports involving other forms of AFSS which are under reported, apart from 3 incidents, the remaining sprinkler activations involved fire sprinkler systems
- Details, on how to report a sprinkler activation can be found in section C of this review.

Part B - Details Data Analysis and Results

For presentation, the data is analysed for the financial year ending March 2022. Of the 53 incidents where sprinklers were recorded as being present and operated.



Residential/domestic premises accounted for 32 activations

32



Non-residential premises accounted for 21 activations

On average.

- 4.4 incidents reported per month
- 1.0 incidents reported per week

The distribution of these fires is shown in figure 1, detailing the number of fire sprinkler saves reported and where fire sprinkler systems actuated by building type and FRS.

It is interesting to compare these to data captured from fire incidents and recorded in the incident reporting systems used by the national governments across Great Britain. From the IRS data across Great Britain for the period 2018/19 to 2020/21 there were on average 200 incidents each year in which sprinklers were recorded as present and had operated. This would indicate the sprinkler saves covered in this report represent around 25% of the fire incidents where sprinklers are recorded.



Figure 1 - Number of fires reported with sprinkler systems activating by building type and Fire and Rescue Service



Figure 2 – Number of fires where sprinkler systems operated by individual building type

71%

A 71% increase of fire sprinkler activations was identified compared to the previous year where 31 activations were recorded.

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Of the 53 incidents reported for 2021/22, purpose-built block of flats dominated the figures with 28 incidents (53%).

Again, it is interesting to compare these to IRS data across Great Britain for the period 2018/19 to 2020/21 for incidents where sprinkler operation is reported. The leading occupancy is once again purpose-built blocks of flats (33% of incidents), but it is not dominant being closely followed by industrial/ factory premises (30% of incidents).

The impact of sprinkler systems can be identified in figure 3 by the effectiveness of the system in containing/controlling or extinguishing the fire.

Residential block of flats Educational Establishments Shopping Centres Recycing plants Warehouses Student Accomodation Leisure/Entertainment Centres Factory Shop Hospital Dwelling (House) Care Home



Contained/Controlled Extinguished

Figure 3 – Impact of sprinkler system by purpose group



The most recent UK research³ was commissioned by The National Fire Chiefs Council (NFCC), National Fire Sprinkler Network (NFSN) and supported by BAFSA. The research report that across all premises types:

- Sprinklers are 99% efficient in extinguishing or controlling a fire
- Sprinklers are 94% efficient in their ability to operate

The finding of this review reinforces the above-mentioned findings that fire sprinklers have been proven to have a good track record in reducing the impact of fire.

The fire sprinkler data recorded in figure 1 is reliant on sprinkler actuations being reported by FRS and other interested third parties connected to the sprinkler industry.

Sprinkler Saves 2022/2023 Review

Looking ahead we will identify the number of sprinkler activations for the period of 2021/2022 recorded by the national incident reporting system (IRS). We expect to be able to obtain this data in the autumn of 2022. This will allow a further study of the reported sprinkler saves to the number of incidents captured by the FRS where sprinklers have contained/controlled a fire.

However, interrogating fire sprinkler data where fire sprinklers were present, operated for England, Scotland, and Wales for the financial years 2018/19 to 2020/21, allows the average number of fire sprinklers activations for a 3-year period over a 12 month, monthly or weekly period to be identified The distribution of these fires is shown in figure 4, detailing the number of fires where sprinkler systems actuated by FRS.



Figure 4 – Number of fires with sprinkler systems activated by Fire and Rescue Service 2018/19 to 2020/2021

Part C – Incident Data report, Focus on Sprinklers

From March 2022, a series of reports are to be published by BAFSA providing a detailed analysis of compound data⁴ on fire incidents in Great Britain where fire sprinkler systems were reported as present, operated over the period of 2018/19 to 2020/21. The aim of the analysis is to focus on identifying trends, discussion points and insights relating to the use of sprinklers within Great Britain. The outcome of which will evidence that can be used to influence change making the installation of fire sprinklers the norm not the exception.

The reports will focus on a range of building types including purpose-built blocks of flats, educational and industrial.

Reporting a Sprinkler Save

The importance of reporting a sprinkler save should not be underestimated, we want to enhance protection against fire through the increased acceptance and use of fire sprinklers by encouraging the wider acceptance and installation of fire sprinklers driving a culture change so that fire sprinklers are understood and accepted as the norm in the United Kingdom.

Reporting a sprinkler save will make a difference if you hear of a save report it.

To submit a sprinkler save use the designated sprinkler activation report form online, or downloadable from www.sprinklersaves.co.uk.

All completed sprinkler saves to be forwarded to: nick.coleshill@bafsa.org.uk

 LFB letter - Fire Safety in London's Shopping Centres – accessed from https://www.london-fire.gov.uk/media/5399/letter-to-londonshopping-centres-regarding-fire-safety.pdf

^{1.} Source: FOI Requests for Incident Recording System Data relating to primary fires attended by FRSs in which sprinklers were present for England, Scotland, and Wales for the financial years 2018/19 to 2020/21

Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data – Optimal Economics 2017
 Source: FOI Requests for Incident Recording System Data relating to primary fires attended by FRSs in which sprinklers were present for England, Scotland, and Wales for the financial years 2018/19 to 2020/21

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Appendix A, Sprinkler Saves reported for the financial year ending March 2022

No.	Date of incident	Location	FRS	Premises type	Occupancy	Location of fire	Main source of	Sprinkler system	Impact of sprinkler system	Number of heads
						_	ignition			actuated
1.	09/04/2021	Southend	Essex	Residential	Purpose built Flat, 4 to 9 storeys	Room	Unknown	Wet Pipe	Contained/Controlled	1
2.	07/05/2021	Manchester	G. Manchester	Non-Residential	Recycling Centre/Plant	Loading Bay	Unknown	Dry Pipe	Contained/Controlled	20
3.	30/05/2021	Birmingham	West Midlands	Residential	Purpose built Flat, 10 or more storeys-	Balcony	Unknown	Wet Pipe	Contained/Controlled	1
4.	03/06/2021	Flint	North Wales	Residential	Purpose built Flat, 10 or more storeys¬	Kitchen	Cooking	Wet Pipe	Extinguished	1
5.	13/06/2021	Cleveland	Cleveland	Residential	Purpose built Flat, 4 to 9 storeys	Kitchen	Cooking	Wet Pipe	Extinguished	1
6.	19/06/2021	Salford	G. Manchester	Residential	Purpose built Flat, 10 or more storeys¬	Refuse Store	Unknown	Wet Pipe	Contained/Controlled	2
7.	07/07/2021	Stockport	G. Manchester	Residential	Purpose built Flat, 10 or more storeys-	Refuse Store	Unknown	Wet Pipe	Contained/Controlled	1
8.	07/07/2021	Sheffield	S. Yorks	Non-Residential	Hospital	Laundry	Electrical	Wet Pipe	Extinguished	unknown
9.	10/07/2021	London	LFB	Non-Residential	Shop	Kitchen	Electrical	Wet Pipe	Contained/Controlled	2
10.	12/07/2021	Southampton	Hamps & IOW	Residential	Purpose built Flat	Room	Unknown	Wet Pipe	Contained/Controlled	1
11.	12/07/2021	Coventry	West Midlands	Residential	Student Accommodation	Kitchen	Cooking	Wet Pipe	Extinguished	Unknown
12.	16/07/2021	Erith	LFB	Non-Residential	Warehouse	Room	Electrical	Wet Pipe	Contained/Controlled	5
13.	24/07/2021	Stockport	G. Manchester	Residential	Purpose built Flat, 4-9 storeys	Room	Electrical	Wet Pipe	Extinguished	1
14.	02/08/2021	Eccles	G. Manchester	Residential	Purpose built Flat, 10 or more storeys-	Room	Electrical	Wet Pipe	Extinguished	1
15.	07/08/2021	Newport	South Wales	Residential	Residential block of flats	Refuse store	Unknown	Wet Pipe	Extinguished	Unknown
16.	07/08/2021	Waltham Abbey	Essex	Non-Residential	Warehouse	Room	Unknown	Wet Pipe	Contained/Controlled	Unknown
17.	07/08/2021	Lincoln	Lincolnshire	Residential	Purpose built Flat, Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1
18.	08//08/2021	Nottingham	Nottingham	Non-Residential	Leisure & Entertainment Centre	Retail Unit	Unknown	Wet Pipe	Extinguished	Unknown
19.	08/08/2021	Coventry	West Midlands	Residential	Purpose built Flat, 10 or more storeys-	Refuse store	Unknown	Wet Pipe	Contained/Controlled	Unknown
20.	11/08/2021	Rufforth	N. Yorks	Non-Residential	Recycling centre/ Plant	Warehouse	Unknown	Pre-action	Extinguished	9
21.	17/08/2021	London	LFB	Residential	Purpose built flat, 10 or more storeys-	Room	Unknown	Wet Pipe	Extinguished	Unknown
22.	02/09/2021	Edinburgh	Scottish	Non-Residential	Education , Community High School	Toilet	Malicious	Wet Pipe	Contained/Controlled	Unknown
23.	09/09/2021	London	LFB	Non-Residential	Retail , Shopping Centre	Retail Unit	Electrical	Wet Pipe	Contained/Controlled	Unknown
24.	16/09/2021	Luton	Beds & Luton	Non-Residential	Retail , Shopping Centre	Retail Unit	Electrical	Wet Pipe	Contained/Controlled	Unknown
25.	28/09/2021	High Wycombe	Bucks	Residential	Purpose built Flat, Residential	Not known	Careless Disp	PP System	Extinguished	1
26.	29/09/2021	Croydon	LFB	Residential	Purpose built Flat, 10 or more storeys-	Bedroom	Candles	Wet Pipe	Extinguished	2
27.	12/10/2021	Harlow	Essex	Residential	Purpose built Flat, Residential	Room	Candles	Wet Pipe	Extinguished	Unknown
28.	17/10/2021	Stratford	LFB	Non-Residential	Retail , Shopping Centre	Retail Unit	Electrical	Wet Pipe	Contained/Controlled	Unknown
29.	29/10/2021	Bromford	West Midlands	Residential	Purpose built Flat, 10 or more storeys-	Room	Unknown	Wet Pipe	Extinguished	Unknown
30.	29/10/2021	Wolverhampton	West Midlands	Non-Residential	Factory	Roof Space	Unknown	Wet Pipe	Contained/Controlled	Unknown
31.	01/11/2021	St Austell	Cornwall	Residential	Purpose built Flat, 10 or more storeys-	Kitchen	Cooking	Wet Pipe	Extinguished	1
32.	04/11/2021	Elephant & Castle	LFB	Residential	Purpose built Flat, 10 or more storeys¬	Balcony	Smoking M	Wet Pipe	Contained/Controlled	1
33.	21/11/2021	Isle of Dogs	LFB	Residential	Purpose built Flat, 10 or more storeys-	Room	Electrical	Wet Pipe	Extinguished	3
34.	22/11/2021	Swindon	Dorset & Wilts	Non-Residential	Education , Primary School	Toilet	Smoking M	Wet Pipe	Contained/Controlled	Unknown
35.	24/11/2021	Ilford	LFB	Non-Residential	Education, Academy School	Changing R	Smoking M	Wet Pipe	Extinguished	1
36.	13/12/2021	Clapham	LFB	Residential	Purpose built Flat, 10 or more storeys	Utility room	Electrical	Wet Pipe	Extinguished	1
37.	17/12/2021	Gateshead	Tyne & Wear	Non-Residential	Warehouse	Room	Electrical	Wet Pipe	Extinguished	3
38.	24/12/2021	Enfield	LFB	Non-Residential	Recycling Plant	Loading Bay	Electrical	Wet Pipe	Contained/Controlled	Unknown
39.	24/12/2021	London	LFB	Residential	Purpose built Flat, 4 to 9 storeys	Bedroom	Smoking M	Wet Pipe	Extinguished	1
40.	29/12/2021	Rhondda	South Wales	Residential	House	Kitchen	unknown	Wet Pipe	Extinguished	1
41.	07/01/2022	Newcastle	Tyne & Wear	Residential	Purpose built Flat	Kitchen	Smoking M	Wet Pipe	Contained/Controlled	1
42.	24/01/2022	Derby	Derbyshire	Residential	House	Kitchen	Electrical	Wet Pipe	Extinguished	1
43.	27/01/2022	Winstord	Cheshire	Non-Residential	ractory	Not known	Unknown	Wet Pipe	Contained/Controlled	Unknown
44.	27/01/2022	Nownert	Northants	Non-Residential	Cdre Home	Laundry Rofuse stars	Liectrical	Wet Pipe	Contained/Controlled	1
45.	10/02/2022	Sheffield	S Vorke	Non-Posidontial	Shop	Loading Bass	Smoking M	Wet Pipe	Extinguished	1
40.	17/02/2022	Bedford	Bedfordshire	Residential	Purnose huilt Elat 10 or more stories	Kitchen		Wet Pipe	Extinguished	1
47.	20/02/2022	Avrshire	Scottish	Non-Residential	Education School	Server	Electrical	Wet Pipe	Extinguished	Linknown
40.	28/02/2022	Chester	Cheshire	Residential	Purpose huilt Flat 10 or more stories		Flectrical	Wet Pine	Extinguished	1
50	16/03/2022	Lutterworth	Leicestershire	Non-Residential	Warehouse	Warehouse	Unknown	Wet Pine	Contained/Controlled	2
50.	17/03/2022	Irvine	Scottish	Residential	Purpose built Flat. Residential	Kitchen	Cooking	Water Mist	Contained/Controlled	1
52.	19/03/2022	Brighton	East Sussex	Residential	Purpose built Flat, Residential 4-9 storevs	Balconv	Smoking M	Wet Pine	Contained/Controlled	1
53.	29/03/21	- Liverpool	Merseyside	Non-Residential	Retail Centre Restaurant	Shop floor	Electrical	Wet Pipe	Extinguished	1
L	· · ·	· ·	,		1	· · ·	· · ·		-	

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The accuracy of the data cannot be confirmed until the release of official government fire data of primary fires attended by FRS for the period of April 2021 to March 2022.

Historic buildings burnt to the ground



Galleries & libraries destroyed by fire



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Preparations for sprinkler testing

Duff House – 25 years of safety with sprinklers



READERS OF SPRINKLER FOCUS WILL NOT NEED TO BE REMINDED OF THE LITANY OF SERIOUS FIRES IN HISTORIC BUILDINGS OVER THE PAST 50 YEARS. THE MOST RECENT TRAGEDY, INVOLVING THE MAJOR DESTRUCTION OF PARTS OF NOTRE DAME CATHEDRAL, IN PARIS ONLY SERVE TO POINT HOW VULNERABLE OUR BUILT HERITAGE REMAINS REFLECTS STEWART KIDD, SPECIAL PROJECTS ADVISER, BAFSA

HERITAGE ORGANISATIONS IN Scotland have a track record of utilising automatic fire suppression systems (AFSS) to supplement more conventional fire protection measures. The National Trust for Scotland, The National Library of Scotland and Registers of Scotland have all utilised AFSS. In 1995, Duff House, a Category A building, then largely empty and unused building in the care of Historic Scotland (now Historic Environment Scotland) underwent a major refurbishment to make it a suitable location for the display of arts and antiquities from the collections of the National Galleries of Scotland.

The refurbishment undertaken had been informed by a major fire strategy review and included the installation of an air sampling detection system, electronic point detection and an automatic fire sprinkler system protecting the whole property. The fire systems were supplemented by a sophisticated security and surveillance installation. The lifting of floorboards to allow for re-wiring greatly facilitated the installation of sprinkler pipework on the upper floors.

The presence of the sprinkler system was deemed essential not only to protect this important building, which is open to the public, but also to protect the valuable contents which are in the care of the National Galleries of Scotland. The property's location means that the initial fire service response is from retained fire crews and even under ideal conditions it could take up to 90 minutes for additional appliances and specialised equipment to respond from Aberdeen or Inverness.

The upcoming 25th anniversary of the sprinkler installation generated a consultant's recommendation that the sprinkler

system should be subject to the 25-year test protocols as required in TB203 of the LPC Sprinkler Rules. At the same time, a second recommendation (yet to be implemented) proposed the installation of a new packaged pump house to replace the existing underground structure which has proved to be unsatisfactory from a maintenance perspective and which had been affected by riverine flooding.

Any entry to the tank requires full confined spaces protection, including harness and hoist, air monitoring and a standby person. During the 25-year monitoring exercise, several entries to the pump house were necessary and this served to confirm to HES personnel the very real need for a new pumphouse.



Access to underground pumphouse

MAINTENANCE OF AUTOMATIC SPRINKLER SYSTEMS

While the Duff House system was installed in compliance with the BS 5306 Part 2 (1990), the standard was silent on 25 year testing and indeed, also silent on any requirements for verifying sprinkler heads or the condition of pipework. TB6 of the 2000 iteration of the LPC Rules is also silent on any specified testing procedure for sprinkler heads. It was therefore decided to utilise the requirements of TB203.3.8.3 which specifies 25-year testing of sprinkler heads (replacing the Annex K of BS EN 12845-1 (2019). Annex K additionally suggests the flushing and pressure testing of pipework and the internal and external examination of the pipework with removal of pipe sections for detailed examination.

DUFF HOUSE SPRINKLER TEST PARAMETERS

Following extensive discussions with all parties it was agreed that the following tests would be undertaken:

At least 10 sprinkler heads to be removed, immediately replaced with new heads, and the old heads sent to the FPA for testing. The heads selected for testing represented a cross section of locations and environments in the building including those subject to the greatest fluctuations of temperature and humidity.



Installation of Zone Check Unit in store room

- Locate and remove the pipe sections identified by HES for visual examination on site and immediate replacement of sections by new pipe. Pipe sections to be then subject to metallurgical tests off-site.
- Relocation of a single sprinkler head in the Dry Store to a new location in the same room as agreed between the consultant, the contractor and HES.
- All work to be subject to an agreed Method Statement with an absolute prohibition against hot work within the building.

It was also agreed that the opportunity would be taken with the Installation drained to install a new 'ZoneCheck' device at a location to be agreed with the HES architect, HES Operations Department, the contractor and the consultant. The location selected was convenient in that there was a length of surface run pipe present at high level which would obviate any casual interference with the unit. The fire alarm contractor and the site electrician were present at the same time to allow the necessary connections.

METHOD STATEMENT

The HES M&E consultant and the sprinkler consultant worked with the nominated sprinkler contractor to produce and outline Method Statement supplemented by individual, detailed method statements covering the following:

- Whole system flush and drain
- Removal and replacement of designated sprinkler heads including details on how residual water in range pipes is to be controlled in a highly sensitive environment.
- Removal of designated pipe sections and reinstatement including details on how residual water is to be controlled in a highly sensitive environment.
- Installation of ZoneCheck unit
- Recommissioning of AFSS and air/water tests and surveillance

It was recognised at an early stage of planning that full compliance with the TB would not be practicable most notably in the number of heads to be tested. Table203.T1 suggests that fir installation of up to 5000 installed heads, 20 should be sampled. In the case of Duff House with fewer than 500 heads, it was considered that a minimum of 10 should be sampled. It was also recognised that while the samples should be representative of the conditions in the building there should be some latitude in respect of avoiding locations where damage to fine surfaces could be encountered or where leakage following recommissioning could damage collection items, especially wall hung paintings.

SAFETY DURING THE TESTS

Following expressions of concern expressed by NGS staff it was decided to modify the original selection of heads for removal and focus on those in areas where there were no collections items which might be damaged. While this meant that the samples taken deviated from the LPC Rules requirement, this was acceptable as the support locations (such as attics, storerooms, kitchens and corridors) were the areas most subject to higher humidity levels than the showrooms and also subject to temperature fluctuations.



Protective sheeting prior to installation of Zonecheck

Chasing wall prior to removal of sidewall head

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The agreed work specification included requirements for protection of surfaces from leaking or ejected water. Where chasing work was required, this was undertaken by HES own craftspeople.

The small on-site project management team (the HES District Architect, HES M&E specialist, the resident property manager and the consultant) were to be on site for the duration of the works and this proved very useful in ensuring that ad-hoc changes in the plan could be undertaken swiftly. Given that the project was undertaken during COVID restrictions, each of the team members had their own designated office space.

THE SPRINKLER HEAD SAMPLING PROCEDURE

Following system isolation and drain down, the selected heads were removed, labelled and boxed. Great care was taken to prevent water damage to surrounding areas but, in the event, the drain down left little water in the system. Interestingly, the attic pipework retained the most water and the opportunity was taken to fit additional drain valves at the lowest level in the system to facilitate future work.



New drain line and pressure gauge. Note smoke detector has been covered to prevent ingress of water.

The new pipework feeds a relocated sidewall sprinkler head with protective cage and the pressure test pump connected to the drain line.



The heads removed were labelled and then placed in a box previously supplied by the FPA. Pipe sections were also labelled for shipping.



Visualisation of the pipe sections suggested that there was, in fact, little corrosion and virtually no obstruction.

REPORT ON SPRINKLER HEADS REMOVED

The FPA normally quote a turn round time of 3 - 4 weeks for test reports but given the importance of the building and its contents and the fact that this was probably the first 25-year test carried out on a listed building they delivered the report within a week.

Extracts from the report can be seen below in Figures 1, and 2 which generated the conclusion that the heads were in an acceptable condition to remain in place for the foreseeable future.

Figure 1

Specimen 8	
Customer Label	Attic space, 25/5/21
Deposits and Paint	Slight build-up of dirt/dust.
Mechanical Damage	None identified.
Waterway	No significant foreign matter present.
Operating Mechanism	68°C, red, glass bulb, 3mm Ø.
Markings	Deflector plate: '1994', 'UL 701A', 'ULC', '68°C', '155°F', 'F1FR', 'Q.R. EC', 'PEND.'. Flats: 'BASCO', 'F1'
	1.446.14.666,111.

Figure 2

Specimen 11	
Customer Label	Attic space, 25/5/21
Deposits and Paint	Slight build-up of dirt/dust. Build-up of turquoise deposits on the deflector plate, valve assembly and non- critical areas (see Figure 7).
Mechanical Damage	None identified.
Waterway	Build-up of brown deposits.
Operating Mechanism	68°C, red, glass bulb, 3mm Ø.
Markings	Deflector plate: '1994', 'UL 701A', 'ULC', '68°C', '155°F', 'F1FR', 'Q.R. EC', 'PEND.'.
	FIAIS. NAGOO, FT.

Photos 7 and 8 show the heads as received by the FPA with their comments on condition. Figure 3 shows the analysis of the evaluation of the pipe sections.



Figure 1 – Specimens 1-2



Figure 2 - Specimens 3-



Figure 3 – Specimens 8-11

Photo 7: Overview of heads as received by the FPA

HERITAGE





Ceiling plate broken off sprinkler body.





Build-up of turquoise deposits on the effector plate, valve assembly and noncritical areas.

Photo 8: FPA Comments on head condition

4 Summary of Results

2 pipe samples were received for evaluation. The visual inspection revealed that all crosssections had a light build-up of rust or sediment on the internal surfaces. The measured thicknesses of these deposits are shown in the table below:

Specimen Number	Measured Mean Thickness of Deposits on the Internal Surface (mm)	Approx. Reduction in Cross Sectional Area of Pipe Due to Deposits (%)		
1	0.2	2.9		
2	0.2	1.4		

Measurements taken of the external pipe diameter and pipe wall thickness have been compared to the dimensional requirements of BS EN 10255:2004 for medium and heavy series steel tubes as detailed in tables 3, 4 and 5 of the standards respectively and shown in Annex B of this report. The results are shown below:

Specimen Number	Mean Outer Diameter (mm)	Mean Wall Thickness (mm)	Meets the Dimensional Requirements of BS EN 10255:2004
1	33.7	3.1	1" Medium Gauge
2	60.3	3.4	2" Medium Gauge

Figure 3: Report on Pipe Conditions

CONCLUSIONS

Given that the author believes this was the first example of a 25-year test undertaken in a listed building there was no template to follow or list of lessons of things to do – and things to avoid!

The fact that the worst disclosures relate to a broken celling plate, brown deposits on one waterway, some paint splashes and minor corrosion in non-critical areas was reassuring - and certainly most welcome to HES and NGS.

Even though the project was undertaken during COVID restrictions there were few issues which arose which the on-site team could not handle. The delay to the project (planning started planning in 2017/8) means that all parties had had the opportunity to understand the process and possible risks. The original plan had the 25-year test to take place alongside the installation and commissioning of a replacement pump house but this was deferred.

Lessons learnt included the need for and value of close coordination with all parties and the use of a consultant with significant knowledge of sprinklers and familiarity with the protected property was considered to have been very useful as was the presence of HES specialists. The selection of the right contractor was agreed to be a key item in the process and the flexibility needed to agree on-site variations to the original plan was key to this. It was fortuitous that the contractor selected was already familiar with the building and the system.

The only issue of note resulted from a very minor leak in one of the joints between the Zonecheck unit and the existing pipework. This demonstrates the danger in reusing an existing joint rather than replacing it.



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Time to re-focus?



PERHAPS IT IS MY AGE, AND I APPEAR MORE SAGE THAN MY YEARS, REFLECTS DANNY DOHERTY BAFSA'S ADVISER IN SCOTLAND, BUT RECENTLY I WAS ASKED TO LOOK AT A UNIVERSITY DISSERTATION FOR A YOUNG MAN (ANDREW), I KNOW EMBARKING ON A CAREER AS A SURVEYOR.

ENTITLED 'Analysing the effectiveness of fire suppression technologies in construction', this is obviously not a new subject to many of us but is obviously something of interest to this young man making his way in life.

Andrew looked at differing types of fire suppression systems, in the main sprinkler, mist, gaseous and foam. Challenging the efficiency, effectiveness and the sustainability of all the various types.

Within the process of his dissertation, he studied a number of fire service personnel to provide statistical information. He set out to acquire the opinions of the Scottish Fire and Rescue service on the subject area through an online survey that would produce quantitative data. He would complete the results from the research undertaken and analyse the issues raised from the investigative engagements and finally he was going to provide recommendations to the Scottish Government on the actions that should ensue from the analysis.

A volume of research was carried out, and although his bibliography was quite extensive, by his own admission he is no expert in the field. Rather he is relying on the data received by SFRS. 90 % of those who completed the study were front line operational staff. He does make some leaps of faith when assuming that all members of the fire service are aware of both the governments strategic objectives and have an in-depth knowledge of the Scottish building technical handbooks. As much as though in reality that assumption is flawed it is not unreasonable for the young man to reach it. Having said all that, the main issue here is the answers to the questions that were given which made me step back and think where we are going wrong.

I appreciate that at times we are asked to carry out surveys to assist others. Perhaps we can be guilty of not giving it the attention the subject matter or the author deserves. However, having said that I find it somewhat baffling that 10% of operational frontline firefighters did not see the benefit of fire suppression systems.

- 15% knew nothing about any other type of suppression system that was available other than sprinklers.
- 10% believed that fire suppression systems will not assist the Scottish Government in achieving their sustainability targets.
- 75% believe that water mist is cheaper to install than a sprinkler system.

Andrew does ultimately reach the conclusion that the sooner the fire is tackled the quicker it will be suppressed and eventually extinguished. Subsequently the smaller the fire the less damage

"10% believed that fire suppression systems will not assist the Scottish Government in achieving their sustainability targets."

that is caused and the least impact on the environment, but based on the information gathered he believes that a change of strategy is required and that water mist systems are the only way ahead and that sprinklers are less likely to achieve the goals of the Scottish Government in sustained development.

Interesting as this recommendation is, it raises questions that both I and the author find unusual and wonder why that is the case? Why do a significant number of operational staff know little about suppression systems? Is it because they are not experienced enough to see the benefits? Are they not adequately trained in what suppression systems are and what they can do? Or is it looked upon naively as something that may jeopardise their jobs.

The threat of job losses due to fire suppression systems may seem a little farfetched. However, in the more remote rural areas, having a volunteer or part time station to serve that community is at times difficult to staff for a wide range of reasons. Perhaps there are not enough people there during the day or those that are there are just not interested. Hence suppression in these areas may satisfy part of the Service's statutory duty. Some operational staff believe that the mandatory introduction of sprinklers in new build social housing in Scotland is part of a wider agenda to reduce the number of stations and firefighters. I see the rationale but to date have seen no evidence to suggest that is the case.

The fire service workforce is much younger and due to the change in pension, staff are not 'locked in' to their 30 years service so are leaving much earlier than would have been expected in previous years. Also due to enormous strides in community safety, the number of significant fires has diminished considerably, thus restricting the number of real life incidents that firefighters can learn their trade in. Factor in that on most occasions, unless there is a life risk, the operational firefighting tactics are likely to be defensive.

One thing that cannot be levelled at the Fire Service is lack of training. Several hours of the working day is dedicated to training. I appreciate that some may recently have levelled criticism at the content of that training. And I understand where they are coming from. However, the role of the modern day firefighter has changed dramatically in recent years to the point that I suggest the title should be changed to reflect the modern responsibilities. Water rescue, line rescue, road traffic rescue, trauma care, collapsed structure, biological and terrorist incidents all require a level of expertise that demands a high level and volume of training. That is over and the training for their 'core' business.

Having said that, it would appear obvious that there is a knowledge gap when it comes to suppression systems. I understand that we have carried out training for some services, perhaps it is time to re-focus our efforts and help enlighten what should be our biggest advocates in the finer points of fire suppression and the role it plays within the true rescue service.

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Where does the content for a qualification come from?



HAVE YOU EVER WONDERED HOW DOES A TUTOR KNOW WHAT SKILLS AND KNOWLEDGE IS REQUIRED BY A LEARNER TO BE DEEMED COMPETENT? ASKS RUTH OLIVER, BAFSA SKILLS & QUALIFICATIONS ADVISER.

THE LEVEL 2 CERTIFICATE in Fire Sprinkler Installation was designed by industry representatives from the sprinkler installation environment for those working within that environment. But I hear you ask So how do they know what are the skills and knowledge required to work in the sector?

The answer is National Occupational Standards (NOS), in this case NOS for Mechanical Fire Protection Systems (more commonly known as fire sprinkler systems.

National Occupational Standards (NOS), specify the standards of performance individuals must achieve in the workplace, together with the knowledge and understanding required. They focus on what a person needs to be able to do, as well as what they must know and understand to work effectively. Working groups drawn from all aspects of industry come together to discuss the critical key functions and requirements of specific job roles within the specific sector and over time draw together the statements of competence required covering performance and knowledge. Industry Wide consultation is an essential part of the standards development. It is these



statements that in due course inform the development and content of a qualification.

The NOS for Mechanical Fire Protection Systems have recently been reviewed and BAFSA is pleased to have been involved in Steering and Working Group. Two new units have been developed; Testing the Operational Performance of Sprinkler Systems and Site Surveys to accompany the original six units. An industry wide consultation took place in February 2022 with the NOS Regulator granting approval in March 2022.

The NOS are freely available from ukstandards.or.uk or by request to BAFSA (qualifications@bafsa.org.uk).

As the above standards have been reviewed it is a timely opportunity to review the fire sprinkler installation qualification that is based upon them ie the Level 2 Certificate in Fire Sprinkler Installation. This is currently being undertaken by Skills for Justice Awarding Organisation with BAFSA participation and other industry representatives. The two new NOS units will be considered and may form part of the revised qualification; as separate optional units.

The Level 2 Certificate in Fire Sprinkler Installation qualification is a intended for people employed in installing fire sprinklers to develop the knowledge and competences necessary to meet the industry standards for the installation role. To achieve the SFJ IQ Level 2 Certificate in Fire Sprinkler Installation (QCF) the learner must currently achieve seven mandatory units:

- Communicate effectively in the workplace
- Establish effective working relationships
- Manage own Resources
- Health and Safety
- Awareness of Regulations in the Fire Sprinkler Industry (This unit develops knowledge and understanding; however some assessment criteria should be assessed in the workplace)
- Fire sprinkler installation and handover
- Understanding the Fire Sprinkler Industry

SKILLS & QUALIFICATIONS

BAFSA together with three colleges, Neath Port Talbot College Group (S. Wales), Llandrillo College (N. Wales) and West College Scotland has overseen the development and delivery of a national industry based competency qualification since its initial development in 2015.

COVID 19 encouraged us to look more closely at how on line learning could assist in replacing face to face teaching and in August 2020 the L2 Certificate in Fire Sprinkler Installation was redeveloped to accommodate this style of learning. However, as with many practical engineering subjects, for some, there is no better way than learning face to face.

Now, the qualification has two routes; one for those who are new to the industry or have less than three years installer experience and an alternative route for those experienced installers (with more than 3 years experience).

The qualification remains available for learners aged 18+ and has no formal entry requirements although learners must be able to work at heights.

PROGRAMME CONTENT

<3

for those with less than 3 years installer experience

The learning programme consists of approx. 60 hours learning delivered online through a wide variety of learning methodologies. The learner will be able to access the learning modules and assessments in their own time and at their own pace and is allowed 10 weeks from the time of enrolment to complete their programme. A period of 10 days practical training within college is required within the programme covering Fire Sprinkler Installation & Handover (practical activity).

Completion of the programme is expected to take no longer than 6 months.

For further information please visit https://www.bafsa.org.uk/ skills-qualifications/skills-qualifications/sfj-iq-l2-certificate-in-firesprinkler-installation-online-learning-programme/

PROGRAMME CONTENT

for those with MORE than 3 years installer experience (Experienced worker Route (EWR))

Candidate eligibility for the EWR is 3 years installation experience. With this qualification encompassing both Residential and Commercial Fire Sprinkler installations colleges expect the candidate to have experience in both types of systems, demonstrated within the BAFSA Evidence of prior learning record book*. As part of the qualification evidence requirements candidates are required to complete an Evidence of Prior Learning portfolio for submission to the college. A downloadable template document is available free of charge from the BAFSA Website.

*Those installers that have not had experience in either metallic fire sprinkler systems installations or plastic fire sprinkler systems installations will be required to gain a working knowledge of installation and jointing techniques before completion of the electronic practical module/assessment through a manufacturer training opportunity or a potential one day teaching programme delivered in college at an additional cost.

The learning programme consists of approx. 40 hours learning delivered online through a wide variety of learning methodologies. The learner will be able to access the learning modules and assessments in their own time and at their own pace and is allowed 12 weeks from the issue of joining instructions to complete their programme. No attendance in College is required.

For further information https://www.bafsa.org.uk/sfj-iq-l2certificate-in-fire-sprinkler-installation-experienced-worker-route-online-learning/

With the Industry Skillcard for Fire Sprinkler Installers requiring the above qualification https://www.skillcard.org.uk/types-of-skillcard/ BAFSA continues its mission to see a competent workforce fit for the 21st Century.





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Firefighters battling a fire in a recycling centre in Romania in December 2021

Changing codes

THE EFSN was set up 19 years ago to increase use of sprinkler systems in Europe. We focus on achieving changes in fire safety building codes that require or incentivise sprinklers in certain types of buildings. While these changes are usually incremental, together they signal a change in attitude to sprinklers. They also yield significant market growth - we estimate the European market has more than doubled since we started - and installers in many countries have told me their order books are full to well into 2023. Incentives are where regulators codify the use of sprinklers to permit relaxations in other measures. We already have some examples in Approved Document B, the regulatory guidance for England, such as where fire resistance requirements can be reduced in certain buildings if sprinklers are installed. There is much more of this thinking in BS 9999 and BS 9991, codes of practice for fire safety in buildings and in residential buildings respectively. The latter is under review and we are currently addressing over 1,800 comments on the public draft. One change is to require sprinklers in common corridors of flats. While fire safety designs usually assume there is no fire load there, Fire & Rescue Service incident reports show that corridor fires are common. Another change in the draft is the option to use a battery for backup power supplies. Helpfully, BSI has recently launched a project to develop PAS 63100 Electrical installations – Battery energy storage systems for use in dwellings - Specification.

It is often said that smoke rather than fire kills. Fire tests and CFDmodelling in Belgium and The Netherlands have shown that sprinklers greatly reduce smoke spread, so that smoke control measures can be relaxed. Sprinklers detect fire. Dutch car parks must have fire detection and research is investigating whether sprinklers could also fulfil the fire detection function. Although they take longer to detect a car park fire sprinklers also stop it spreading so occupants have more time to escape than from an unsprinklered car park with electronic detection.

In April five managers of a waste recycling facility in Spain received custodial sentences of more than three years and their company was fined €6 million following a fire that caused significant environmental damage. Their facility did not comply with regulations. In the UK we have seen many waste recycling fires and some are now protected with sprinklers. Yet many are not. In France a national standard for the fire protection of waste recycling centres is being drafted.

We have industry guidance in the UK but a standard would carry more weight.

Still in France, national guidance has been drafted for the fire protection of wooden residential buildings. Wood is being sold in many countries as a sustainable material because trees remove carbon from the atmosphere. Yet wood can burn and there is much discussion around how to mitigate that risk. Sprinklers are the obvious answer.

Where fire codes invoke sprinklers they also refer to design standards. EN 12845-1 is the sprinkler system design and installation standard. Over 4,000 comments were submitted to CEN on a draft revision. Although many are duplications it will take us a long time to go through them. Meanwhile the draft of EN 12845-2, which covers ESFR and CMSA designs, is being translated and will soon be circulated by CEN for enquiry (comment), as will the draft of EN 12845-3, which covers earthquake bracing.

To support design standards we need component standards. EN 12259-13 for ESFR sprinklers has passed the CEN enquiry, the comments have been addressed and it will soon be circulated for formal vote (the final stage before publication). A revision to EN 12259-14 on residential sprinklers, this time without the possibility to use o-ring seals, has been published. Work is progressing on EN 12259-15 for large k-factor, extended coverage and CMSA sprinklers. Pump standards are moving ahead, with the draft for EN 12259-12 about to be circulated by CEN for enquiry; the draft of EN 17451, the pump set standard, should go out for enquiry be the end of this year. Not to be outdone, water mist now has seven fire test application standards and is working on four more, complemented by test protocols for nozzles and other key components.

After two years shut at home it is clear that many of us are keen to meet up again. I am delighted by the enthusiastic response to Fire Sprinkler International 2022 and look forward to seeing many of you in London.



Alan Brinson Executive Director



Think sprinklers... **Think Sprinkler Saves**

NOVEMBER 2021



4: High-rise, London

Eight fire engines and 60 firefighters extinguished a fire on the balcony of an 18th floor

flat caused by careless disposal of smoking materials. Firefighters from London FB used 3 jets via wet rising main, preventing external fire spread from the balcony to the rest of the 32 storey residential block.

Following commencement of firefighting operations, products of combustion entered the four-roomed flat activating the sprinkler head, identifying the clear benefits of sprinklers for firefighters preventing flashover, fire spread and providing a further layer of safety from fire during firefighting operations.

21: High-rise, London

A fire involving an e-bike was extinguished by the activation of three sprinkler heads before

the arrival of the London Fire Brigade. The fire was contained within the five roomed flat on the 3rd floor of the 21 storey building. London FB's fire investigation team believe the fire was accidental and caused a fault in a lithiumion battery for an E-bike that was on charge.

BAFSA Quote

"From July 2021, London FB have attended more than 25 fires involving electric bikes or scooters, resulting in significant incidents, serious injuries"



22: School. Swindon A fire was discovered within a toilet and cloakroom area on the ground floor of a primary

school involving. The ignition of a toilet roll and its plastic holder caused a single sprinkler head to activate, extinguishing the fire and limiting smoke and heat damage.

On arrival, operational crews from Dorset & Wiltshire FRS found that the fire has been completely extinguished by the sprinkler system, proceeded to assist the school in isolating the system.

Group Manager, Dorset & Wiltshire FRS Tim Gray said "The speed of response from the sprinkler system and its control over the fire growth undoubtedly ensured that fire damage was kept to a minimum allowing the school to re-open within 2 days of the fire with as little disruption to the school as possible and no loss of valuable work or property"

24: School, Ilford



Following a fire in a waste bin located in a changing room of a 3 storey Academy school, one concealed sprinkler head operated suppressing,

extinguishing the fire preventing the fire from spreading from the room of origin. Total property area damaged by fire estimated to be under 5 square metres, the cause of the fire is under investigation.

DECEMBER

1: Dwelling, St Austell



fire alarm sounding in a 12 storey block of flats, operational crews were mobilised from St Austell Community Fire Station

On arrival, it was identified that a fire had been extinguished by the residential sprinkler system within a flat. One occupant required medical attention due to the effects of smoke inhalation. The fire was contained within the flat preventing further fire spread and flashover.

The retrofitting of the sprinkler system included all 67 residential flats, communal areas, laundry room and store shed. The installation was completed in February 2019.



13: High-rise flat, London

A single residential sprinkler head operated extinguishing a

fire in the utility room of a 6 roomed split-level flat spanning the 10th and 11th floors.

London FB reported that a woman was rescued from a balcony using a fire escape hood and taken to hospital by London Ambulance Service.



17: Warehouse. Gateshead

Tyne and Wear responded to a fire in a warehouse involving a propane gas-powered forklift

truck and several wooden pallets. Three sprinkler heads installed in the roof void actuated, extinguishing the fire before the arrival of Tyne & Wear FRS.

"Without the sprinkler system, there would have been significant damage to the business, potential risk of injury to members of staff, firefighters due to the risk of the propane gas-powered forklift truck cylinder exploding, the effect of which would of accelerated the fire allowing it to spread rapidly to the combustible materials located in proximity of the fire."



24: Recycling plant, London

Six pumping appliances, and 40 firefighters from London FB

attended a fire in the loading bay of a 2 storey, commercial recycling unit. Ten members of staff left the property before the arrival of the LFB; two men required hospital treatment. The commercial sprinkler system activated suppressing the fire allowing crews to tackle the incident. The concrete silo containing mixed waste has been identified as the seat of the fire



24: High-rise, London

Careless disposal of smoking materials have been identified as the cause of a fire in the bedroom of a third floor flat in a 6 storey converted block of flats.

The blaze was extinguished by one residential sprinkler head before the arrival of the London FB. No injuries were reported.

29: Dwelling, Tonypandy

RSP Fire Sprinkler Systems reported the successful extinguishment of a chip pan fire in the kitchen of a private house before the arrival of South Wales FRS who isolated the sprinkler isolation valve.

Within one hour of the call, the sprinkler engineer was in attendance, with the system recommissioned the following day.

JANUARY 2022



7: High-rise, Newcastle

Tyne and Wear FRS mobilised three pumping appliances and an aerial ladder platform to a fire in the kitchen of a purpose built block of flats.

On arrival crews identified that the fire had been successfully suppressed by the actuation of only one sprinkler head keeping fire, smoke damage to a minimum. No injuries were reported with the occupants safely evacuating the premises before operational crews arrived.

The cause of the fire was yet again careless disposal of smoking materials, which had been discarded in a bin and set fire to the waste materials within.



24: Dwelling, Derby

Nationwide Sprinklers reported a fire involving a tumble dryer in the kitchen of a Derby Homes dwelling where one sprinkler head actuated extinguishing the fire, containing the fire to the compartment of origin.

Derby Homes install sprinklers in all their new build properties.



27: High-rise, Newport

RSP Fire Sprinkler Systems has reported an incident involving the activation of one sprinkler head which successfully extinguished the fire involving a refuse

container located beneath the premises rubbish chute in the bin store in the Green Wood Tower Block.

The system was reinstated within an hour of the activation ensuring the continuity of an additional layer of protection from fire for the residents.



27: Factory, Winsford

Two fire appliances from Winsford and Northwich Cheshire FRS were mobilised for a fire in a macerator on a factory site and on their arrival, crews wearing breathing apparatus discovered that the premises

Automatic Fire Suppression System (AFSS) had operated containing the fire, Involving a piece of machinery.



27: Residential Care Home, Wellingborough

An industrial tumble dryer caught fire in the ground floor laundry room of the 3 storey Dukes Court care home. The fire was contained to the room of origin by

the residential sprinkler system which actuated suppressing the fire before the arrival of Northamptonshire FRS.

John Pratt, Protection Team Lead at Northamptonshire FRS said: "In a residential property housing vulnerable people, some with limited mobility. A thorough fire safety plan and a sprinkler system will save lives."

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BAFSA FOCUS MAY 2022

FEBRUARY



17: High-rise, Bedford

A chip pan fire set off a sprinkler alarm, which transmitted to an alarm receiving centre allowing Bedfordshire FRS to be mobilised.

A single sidewall sprinkler head activated, extinguishing the fire in the social housing development. The sprinkler system was reinstated the following day within 2 hours of being reported, however due to the design of the system, provision of an isolation valve for each individual flat, it allowed the system to stay live for the remaining flats



20: School/Leisure Centre, Garnock

Scottish FRS attended an electrical fire within the Garnock Community Campus school's server room located on the first floor.

Two sprinkler heads activated which contained, extinguished the fire before arrival of fire crews. Fire damage was restricted to under 10m².



28: High rise, Chester

Cheshire FRS responded to a fire in a 13 storey block of flats involving an E-bike which caught alight due to an electrical charging fault.

The Automatic Fire Suppression System

immediately operated with the activation of 1 sprinkler head extinguishing the fire. The resident was asleep in the property at the time of the incident but due to the activation of the sprinkler system no injuries were reported.

BAFSA QUOTE

"This incident clearly reinforces the decision by Sanctuary Housing to retrofit sprinklers in all their high-rise residential buildings providing a further layer of safety from fire for all their residents"

MARCH



16: Warehouse, Lutterworth

Five appliances from Leicestershire and Warwickshire FRS' attended a fire involving the pallet racking system used to store a variety of goods. The cause of the fire is under investigation; however, the seat of the fire was at low level spreading vertically to the pallets above due to the combustible material/fire loading.

The fire was not immediately contained/suppressed by the sprinkler system as in rack sprinkler protection was not installed. The sprinkler system was located above the top layer of racking, resulting in a delay for the predetermined temperature to be reached allowing the sprinkler heads to actuate. In rack sprinkler systems on activation release water into a targeted area to minimise damage, downtime for the facility.

Two sprinkler heads actuated containing/suppressing the fire preventing further fire spread. A forklift was used to remove the damaged pallets affected by the fire. No injuries were reported.

17: Block of flats, Irvine



A cooking fire was contained, and extinguished with minimal fire/smoke damage. Fortunately, the resident was woken by the activation of the misting system with no injuries reported.

Water mist can have a number of highly attractive features when compared to more widely used sprinkler systems including using reduced water storage and smaller diameter pipework.



19: Extra care housing, Brighton

East Sussex FRS attended a fire on the second-floor external balcony of a 5 storey extra housing scheme. The fire did not spread within the whole apartment

due to the prompt activation of the sprinkler system within the flat which activated and raised the alarm.

The cause of the fire has been contributed to careless disposal of smoking materials identifying once again the benefits of residential sprinkler systems.



29: Restaurant, Liverpool

An electrical fire was extinguished by a restaurant's commercial sprinkler system. The prompt activation of the sprinkler system minimised fire and smoke damage resulting in minimal impact on the business.

APRIL



2: High-rise student accommodation, London

London FB attended a fire involving a communal kitchen on the second floor of a student accommodation block resulting in the evacuation of 190 people.

Five Sprinkler heads activated containing/controlling the fire to room of origin, on arrival operational crews wearing breathing apparatus extinguished the fire using one jet.



20: Refuse/Bin Store, Newport

South Wales FRS reported a fire which started in the refuse/bin store of high-rise premises owned by Newport City Homes. Smoke generated from the fire percolated upwards to various floors via the bin chute.

Due to the refuse bin not being in its normal position directly below the sprinkler head, the system did not immediately activate and extinguish the fire. However following the rupture of an aerosol can in the refuse bin, the sprinkler head did actuate, extinguishing the fire.



26: High-rise, Doncaster

South Yorkshire FRS responded to a report of a fire in the bedroom of a first floor flat. One fire sprinkler head actuated successfully extinguishing the fire before the arrival of SYFRS.

Fire damage was contained to the room of origin The cause of the fire was identified as a set of heated curlers left on the bedding which caught light, the resident tried to extinguish the fire but unsuccessful and evacuated the flat.



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Technical questions & answers

The BAFSA Technical team receives questions and enquiries daily, some of them more challenging to respond to than others but the team will always provide an appropriate and informed response... Here are just a few.

Will a sprinkler head operate in a 'dead' air space where there is no air circulation and not easy to access. The head has a 74°C fusible link with a 57°C cover plate.

ANSWER

Sprinkler heads in 'dead', hard to access spaces could be problematic because they are not easy to inspect or could be inadvertently overlooked. BS EN 12845 Sprinkler Rules makes a reference to unventilated concealed spaces in paragraph 14.4 but does not mention the accessibility of the space. It states the following: 'In unventilated concealed spaces it may be necessary to install sprinklers with a higher operating temperature, up to 93°C or 100°C. Sprinkler heads in such spaces will operate if the temperature exceeds their normal operating temperature'. We have been told that we cannot use elbows on our proposed new sprinkler system but must use 'standard bends'. Can you please advise where this is required in the sprinkler rules?

ANSWER

Bends usually have a curve to change direction as against and elbow which is nearly a sharp 90° change of direction. The sprinkler rules BS EN 12845 only differentiate between bend and elbow in Table 23 for equivalent lengths used for hydraulic calculations. Maybe someone is confusing the requirements of BS9990 for Wet and Dry risers where it states: "All changes in the direction of the run of the piping should be made with standard bends, springs or long turn fittings. Elbows should not be used." **VFPA** Sprinkler rules have been suggested for a new installation in our building. Are these common for use in the UK?

ANSWER

Besides BS EN 12845 Sprinkler Rules the other most commonly used commercial sprinkler design rules used in the UK are NFPA (13 and 20) + F. M. Global Data Sheets. Many American companies who have sites in the UK may have American insurers and they tend to lean towards using NFPA Rules. Probably because they are more familiar with NFPA rules and less familiar with the UK/ European rules. These American standards, though not the most commonly used, are nevertheless familiar to, and used by, sprinkler designers. NFPA are a proven and reliable set of standards for sprinkler systems. Can you please advise on how do we go about getting a sprinkler system installed in our 4000 m² / 10 m high building?

We suggest you have a look at the BAFSA website. If you visit the weblink below you will see a list and the contact names/ email/telephone numbers of accredited sprinkler system installers. They can give you a quotation for the job and will help you determine the hazard classification of your building based on the storage/process involved.

https://www.bafsa.org.uk/find/

Can you please advise on what are the requirements for pressure switches for pumps in a residential sprinkler system?

ANSWER

Paragraph 5.12.4 in BS 9251 mentions that 2 x pressure switches OR 1 x pressure switch + 1 x transducer can be used. It does not elaborate on type, only function. We would suggest you have a look at LPCB's website and see what switches etc. they list. It will list equipment has been tested to a high standard. Note: BS 9251 does not specify 'approved' but it would expect that it's reliable/proven capability equipment.

? Can you advise on how much clearance there must be between the sprinkler head and our goods stored in metal racks?

ANSWER

The clearance from the sprinkler deflector to the top of storage is 150mm as a minimum for all sprinklers except flat spray heads as stated in BS EN 12845 Sprinkler Rules paragraph 12.5.1.

On a building site with very restricted access for the fire brigade will the installation of sprinklers allow us to increase the hose length?

ANSWER

There are circumstances where the installation of sprinklers will allow the hose length to be increased from 45m to 60m. We suggest you discuss with your local building control officer to establish if this can be applied to your building. When we replace our wet riser pumps do they have to be of the LPCB approved type and do we have to fully comply with BAFSA Information File 21 for wet and dry risers?

ANSWER

Pumps for wet risers do not have to be listed by a third party like LPCB. But LPCB listed pumps are commonly used for this purpose because we have the reassurance that they comply with a rigorous standard. It is noted that on a prominent pump supplier that they default automatically to supplying LPCB listed pumps. BAFSA Document 21 is just a general guidance/information file for wet/dry risers, it is not a regulation that the law requires you to follow. We would encourage the use of third party listed equipment for peace of mind. What is currently installed on your site? Are they LPCB or other approved pumps? If they are then that is what was acceptable to the AHJ's at the time of installation, and it's likely they would expect any replacements to be to an equal or higher standard.

Can you direct me to any documents that relate to temporary fire protection requirements for a building during construction stage i.e., requirements for dry riser / wet riser? This will help me plan jobs correctly in the future.

ANSWER

The issue of temporary fire protection requirements during the construction stage of buildings is addressed in BS9990:2015 Paragraph 7.2. It states the following: In order that a fire occurring during the construction of a building can be dealt with effectively, especially in high or extensive buildings where large quantities of combustible materials might be stored, mains should be in an operational condition as soon as any floor of the building reaches 11 m above fire service access level. These mains should be extended and commissioned progressively as work on the building proceeds to provide firefighting facilities at all stages of construction. Where wet mains are provided, installation initially can be as a dry main. When construction reaches 50 m, the system should be commissioned as a wet main in accordance with the relevant recommendations of this British Standard.

the Findan

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Is there anything in the standards about possible flooding of a basement when using fire mains?

ANSWER

BS 9990:2015 (Wet and Dry risers) does not address the consequences of flooding of basements (or other areas) in a fire scenario. There is a small mention in BS 9999 about flooding, but it does not go into a lot of detail. Our advice is to ensure that any critical equipment i.e., electrics etc are installed on plinths maybe about 400mm higher than the finished floor level.

Contact us via email ... technical@bafsa.org.uk – the BAFSA Technical team are always there for you.



All of these and more are available to download at bafsa.org.uk

British Automatic Fire Sprinkler Association

