Automatic sprinkler systems are generally recognised as the most effective way to protect people and property from fire. Evidence to support this contention can be found in BIF 19 *Sprinkler Reliability* and also in the universal support enjoyed by sprinklers from both the fire and rescue service and the insurance industry.

Not only are sprinklers very effective at what they do, containing and suppressing fire, sounding a local alarm, calling the fire and rescue service and restricting the growth of fire, but there is clear evidence that when a fire occurs in a sprinkler protected building the fire and property damage incurred is a tiny percentage of that which is likely in an unprotected building. Sprinklers are also very effective at protecting lives including the lives of fire fighters and in the UK there has never been a multiple life loss in a building fitted with a properly designed, working sprinkler system. In industrial and commercial buildings recent real-life incidents have demonstrated the value of sprinkler systems in promoting business resilience with warehouses and factories back at work the day after a fire

The reliability and efficacy of sprinklers demand installations which are:

- Designed strictly in accordance with published national and international standards
- Installed by competent contractors who hold third party certification from an independent, third party certification body
- Subject to regular inspections and maintained in accordance with national and international standards
- Subject to a programme of review to ensure that the system remains compliant for the fire risks present

This publication summarises the main obligations imposed on the owner or occupier of a building or structure which is fitted with a sprinkler system. The advice given also holds true for watermist systems.

Additional information on the topics covered can be found in other publications in this series:

BIF 1 Sprinklers in Schools
BIF 2 Sprinklers in Dwellings

Photo courtesy of FPA

Sprinklers will prevent destructive cooking fires - even involving deep fat frying.

BIF 3 Heritage Buildings and Sprinklers
BIF 4 Sprinklers in Retail Premises
BIF 5 Sprinklers in Warehouses
BIF 6 Frequently Asked Sprinkler Questions
BIF 7 Sprinklers in Hotels
BIF 8D Use of CPVC Pipe
BIF 8F Water Storage
BIF 9 Water Mist
BIF 10A Sprinklers in Car Parks
BIF 13 Sprinklers & Water Supplies
BIF 14 Sprinklers in Residential Care Homes
BIF 15 Types of Sprinkler Systems
BIF 16A Residential and Domestic Sprinkler System Maintenance
BIF 16B Sprinkler System Maintenance to BS EN 12845
BIF 17 Sprinklers in Hospitals and Health Care Premises
BIF 19 Sprinkler Reliability
BIF 20 Third Party Certification
BIF 22 Biodiesel Fuel and Sprinkler Pumps
BIF 23 Sprinklers in Student Accommodation
BIF 25 Sprinklers and the Recycling Industry

These can be downloaded free of charge at: http://www.bafsa.org.uk/publications/bafsa-information-files.php

Even systems with a direct service mains connection should be subject to weekly checks to ensure valves are correctly set

Living with a Sprinkler System

Home owners or those living in houses or flats which are protected by sprinkler systems are unlikely even to notice them. The last page of this publication provides all the information and advice necessary to ensure that such systems will operate as designed.

Owners or occupiers of industrial premises need to take routine steps to ensure that their sprinkler protection is always available to control or suppress any fire which might occur.

Once a sprinkler system has been handed over to its owners, the responsibility for the equipment will rest with them. Whether or not the system will operate as designed will depend on whether the correct maintenance procedures are carried out. UK legislation imposes significant liabilities on employers and/or commercial and industrial property owners who fail to maintain fire safety equipment intended for the protection of life from fire.[1]

Sprinkler System Maintenance

In the UK, sprinklers in non-residential premises should be designed, installed and maintained in accordance with BS EN 12845. Some systems may be installed to other international standards or to those specified by FM Global. Section 20 of BS EN 12845 (which is due to be revised in mid 2015) specifies maintenance requirements. The Standard recommends that the testing, servicing and maintenance be carried out by the system installer or a similarly qualified company but there is no reason why weekly test procedures cannot be carried out by an owner or occupier providing that the person undertaking the work is competent to so do.

Given that a sprinkler system not only protects property but life and is often 'mission critical', the value of following appropriate procedures cannot be over-emphasised. Of particular importance is the need to verify that all valves are left in the correct position and that the system is fully operational on completion of any

1 Article 17, Fire Safety Order 2005. Scotland and Northern Ireland regulations have similar requirements.

test procedure. BAFSA recommends that where these tests are carried out in-house a second person be present to verify that this has been done. Best practice would require that the second person be trained to the same standard to ensure consistency and resilience.

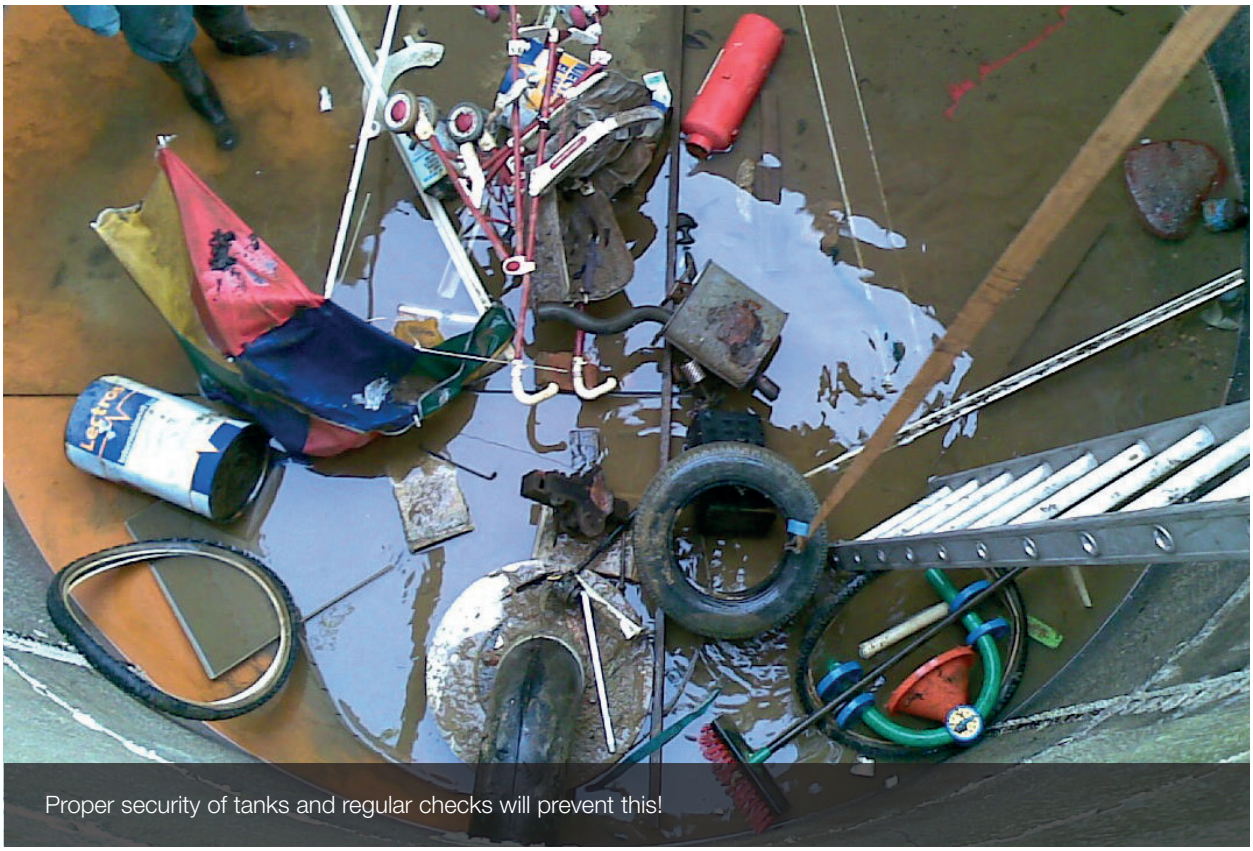
Where sprinkler are installed to meet insurance company requirements then additional rules apply in the form of the Technical Bulletins of the LPC Rules for Automatic Sprinkler Installations[2]. TB 203 reiterates the importance of appropriately trained personnel carrying out the testing procedures and the need for approved companies to carrying out servicing and inspections. This document also emphasises the need for documentation of the testing and servicing and pays particular attention to the need to have in place procedures to be implemented in the event of a shutdown of the system together with the actions to be taken in the event of an alarm signal being received from the installation.

BS EN 12845 requires that the installation is visually checked each week and that action is taken to activate the water-driven motor alarm. This is done by opening a valve to simulate the operation of a sprinkler head. In the case of an installation fed from a service main, it would be necessary to record the readings of the pressure gauges before and after the test

In the case of an installation supplied by pumps the simulation of the sprinkler head activation will cause the duty pump to be operated and provide the opportunity

Diesel driven pumps should be test-run weekly by a competent person

2 Or in the case of insurer FM Global, their data sheets.



Proper security of tanks and regular checks will prevent this!

to witness pump performance and the alarm signal activation. Where a pump is diesel powered, the engine should be run for 20 minutes and checks on the cooling system, oil pressure, batteries and fuel should also be made. In winter it is essential to check that any anti-frost measures such as trace heating, pump-house heating and tank immersion heater are functioning correctly.

BS EN 12845 also requires a quarterly inspection of sprinkler heads, pipework and pipe supports and mandates a flow test be carried out on the water supplies. Section 203.3.2.2 requires that a review of the hazard is carried out on a quarterly basis to ensure that there have been no changes of structure, occupancy, storage configuration, heating, lighting or other parameters that would change the hazard classification of the risk or render the installation in any way inadequate. Prior to 2009, this procedure required the services of a specialist and was normally undertaken by the system installer or specialist maintenance contractor, an insurance surveyor or specialist fire engineer. However the requirement has been relaxed and the hazard review may be undertaken by any competent person provided that a report on the findings is submitted to the sprinkler servicing contractor. BAFSA however strongly advises that at least one hazard review each year is undertaken by a certificated installer.

BS EN 12845 also requires any pumps to be tested at a 'full load' condition on a yearly basis. Additional checks are required on water storage facilities. Tanks should be visually externally checked for corrosion every three years and refurbished as necessary. All storage tanks should be cleaned and examined internally by a competent person not less than 3/10 yearly depending on the type of tank installed.

System Non Availability

If a sprinkler system should become non-operational, for example, because of maintenance work then it is essential that several actions are undertaken. There

is advice on this in Annex J of BS EN 12845 and TB 203. BAFSA would suggest that the following summarises the actions to be taken in the event that a system will be impaired for any significant period - say for more than one hour.

There are two principal, specified duties which will be a feature of all insurance policy wordings where the presence of sprinklers is mandated or where a premium discount has been allowed in respect of the fitting of sprinklers. In the event of an impairment, the insured must:

1. Advise the local fire and rescue service; and

2. Inform the insurers.

There are a number of other actions which can usefully be taken in the event of planned or unplanned shutdowns:

- Inform all building users and other occupiers and anyone else who might need to know.
- Implement the planned shutdown procedures
- Minimise the possibility of a fire occurring
- Patrol the area affected continuously
- Subject all hot work to a permit system
- Prohibit smoking and naked lights in the vicinity
- Minimise the possibility of a fire spreading
- Close fire doors and shutters
- Making ready extinguishers and hosereels with sufficient trained personnel available to handle them

BAFSA would go further than Annex J and suggest that the following obligations should be complied with in the event of prolonged sprinkler system impairment:

- A formal, written procedure in place to deal with any impairment of the fire protection systems
- Cessation of hazardous activities including all hot work and any routine maintenance activity
- Limit operation of power equipment including cranes, conveyors, fork lift trucks etc - especially recharging
- Notification of interested parties including insurers/tenants

Minimising Water Damage

Owners and occupiers should be alert to the potential for water damage in the event that the system operates to deal with a small fire which is swiftly extinguished. Under no circumstances should the main sprinkler stop valve be operated in a fire situation without the authority of the fire service incident commander. However, if only one or two heads have opened and it is clear that the fire is out, consideration can be given to minimising the further flow of water by blocking the sprinkler head with a sprinkler stopper (if one is available) or using a wooden or rubber wedge cut to size.

In larger premises the maintenance and security personnel should be trained to understand how the sprinkler system operates and how to take action in the event that a sprinkler head operates following mechanical damage.

Following the operation of sprinkler heads the system should be reinstated as soon as possible by the nominated sprinkler maintenance contractor.

Living with a Domestic Sprinkler System

Sprinkler systems require little maintenance with the exception of an annual inspection which should be undertaken by a competent person.

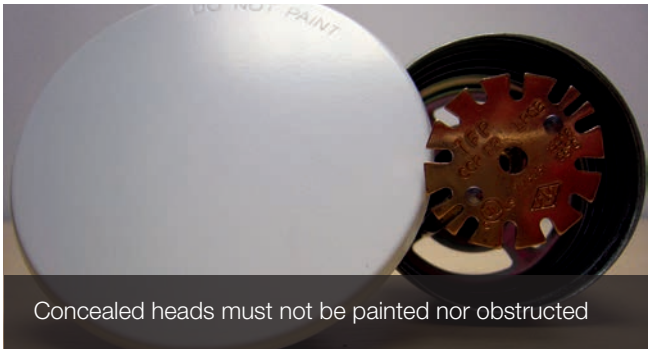
However, occupiers of sprinklered homes should be aware of how the system works and what to do in the case of faults or actuations.

To assist with this the installer should have provided a logbook[3] containing:

- Details of the system design, waters supplies and components
- A statement of compliance with the BS9251:2014 or other appropriate standard
- Results of the commissioning tests
- Details of authorities consulted
- A routine inspection and maintenance programme
- A 24 hour emergency contact number which can be used to obtain assistance
- Where systems have self-monitoring pumps, occupiers should be aware that the system will test itself each week and will sound a local alarm if any faults occur during the self-test. Some systems may automatically report faults to the installation company.

Occupiers of sprinkler protected dwellings should know where the stop valve is

3 If you can't locate this ask your house builder or landlord or contact the installer whose name and phone number should be on a tag near the system's controls



Concealed heads must not be painted nor obstructed

You should know where the sprinkler system shut-off valve is - this will enable fire fighters to shut the system down once they are sure that the fire has been extinguished.

You should also be aware of measures which may compromise the operation of the system:

- Do not paint the sprinkler heads and/or their cover plates. The added coat of paint will absorb heat and can delay the operation of the sprinkler. The paint might also prevent water from flowing.
- Do not hang *anything* on the sprinkler heads. Sprinklers are sturdy, but hanging something on them could dislodge the device that holds the water back.
- Make sure that tall items of furniture or ornaments are not so placed as to shield the sprinkler heads or obstruct the flow of water.
- No modification should be made to any sprinkler equipment except in accordance with BS9251:2014 or any other standard utilised.
- Reinstatement of the system following maintenance or actuation should only be undertaken by a competent person and the log book annotated to indicate the reason for reinstatement and any actions taken
- Sprinkler systems must be protected from freezing, external pipes may be protected by trace heating, internal pipes will be protected by central heating systems so these should be left on if the house is unoccupied during periods when extremely low temperatures are predicted.

bafsa

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