Fire Protection Association

RISCAuthority

ACTIVE FIRE PROTECTION GUIDE
COMMERCIAL DETECTION SYSTEMS SERIES OVERVIEW

Contents

1 Introduction

This document is part of a series of Active Fire Protection Guides (AFPGs) produced by the RISCAuthority Suppression & Detection Working Group to provide summary information on the main types of fire protection technologies currently available. This guide provides overarching information to support the AFPG Detection Series with information that is common to all detector technologies.

Choosing the most appropriate technology for any given situation requires the specifier to understand many important factors, such as the risk that needs protecting, the most appropriate indicators of fire to use for detection purposes, the protection objective and how it fits in with the overall building/business fire management strategy, and the advantages/disadvantages and limitations of each technology type. This document and the associated guides are not intended to give definitive advice on system selection but should be considered as a primer, presenting key 'need-to-know information' for each of the main detector technologies, and act as a starting point in collating the relevant information needed to make a good choice of system.

2 Fire detection basics

The need for a fire detection and fire alarm system in any specific building is normally determined by the authority responsible for enforcing fire safety legislation in that building and/or by a fire risk assessment carried out by the owner, landlord, occupier(s) or employer(s), as appropriate. In general, it is appropriate to install some form of fire detection and fire alarm system in virtually all buildings, other than very small premises that are relatively open plan.

Fire detection and alarm systems are the primary means of alerting people and attached systems to the potential outbreak of a fire. They may be designed primarily for the protection of business and property or life (and combinations thereof) which influences the extent of coverage, the resilience of the equipment, and types of detector technology used. The key components of the system include:

- detectors and manual call points
- wiring or wireless network
- Control and Indicating Equipment (CIE) – Control Panel
- alarm sounders and indicators.

The CIE performs the role of:

- power supply to components
- receipt of signals from detectors, manual call points, and other detection and suppression systems
- determining if the signals correspond to an alarm condition
- indicating fire alarms audibly and visually
- indicating the location of the alarm
- recording events
- monitoring system health and warning of faults
- routing alarms to the Fire Service or Alarm Receiving Centre (ARC)
- control other fire safety equipment (such a dampers, suppression, evacuation lighting etc.).

A myriad of detector technologies has evolved to address the risk control requirements of all types of hazards in a wide range of onshore and offshore environments. A good detector used in the right environment should be discerning enough to detect fire robustly and quickly and not trigger on false (signals that are nothing to do with fire, such as steam), and unwanted (features of fire that are shared with other scenarios, such as heat), influences. The greatest criticism of fire detection and alarm systems is their false alarm frequency which can render them 'unbelievable' by occupants and the Fire Service, which can lead to delays in action as the root cause is investigated, and lead to increased potential life safety risk and property/business damage.

3 Categories of fire alarm and detection system

Fire detection and fire alarm systems can be installed in buildings to satisfy objectives pertinent to life safety, property protection, business continuity, and environmental protection. Because of the great variety of applications for systems, BS 5839-1 Fire detection and fire alarm systems for buildings – Part 1: Code of practice for design, installation, commissioning and maintenance in non-domestic premises, divides them into a number of categories as follows:

3.1 Category M (Manual)

Category M systems are entirely manual systems and incorporate no automatic fire detectors.

3.2 Category L (Life)

Category L systems are automatic fire detection and fire alarm systems intended for the protection of life. They are further divided into subcategories L1 to L5 in which the lower number represent a higher level of coverage.

a) Category L1: systems installed throughout all areas of the building. The objective of a Category L1 system is to offer the earliest possible warning of fire, so as to achieve the longest available time for escape.
b) Category L2: systems installed only in defined parts of the building. A Category L2 system ought to include the coverage necessary to satisfy the recommendations for a Category L3 system; the objective of a Category L2 system is identical to that of a Category L3 system, with the additional objective of affording early warning of fire in specified areas of high fire hazard level and/or high fire risk.
c) Category L3: systems designed to give a warning of fire at an early enough stage to enable all occupants, other than possibly those in the room of fire origin, to escape safely, before the escape routes are impassable owing to the presence of fire, smoke or toxic gases.
NOTE *To achieve the above objective, it is normally necessary to install detectors in rooms which open onto an escape route.*
d) Category L4: systems installed within those parts of the escape routes comprising circulation areas and circulation spaces, such as corridors and stairways. The objective of a Category L4 system is to enhance the safety of occupants by providing warning of smoke within escape routes.
NOTE *The installation of detectors in additional areas is not precluded, and the system could then still be regarded as a Category L4 system.*
e) Category L5: systems in which the protected area(s) and/or the location of detectors is designed to satisfy a specific fire safety objective (other than that of a Category L1, L2, L3 or L4 system). Often the design is based on a localised need for fire detection in only part of a building. Protection might be provided to compensate for some departure from normal guidance elsewhere or as a part of the operating system for a fire protection system. Such a system could be as simple as one that incorporates a single automatic fire detector in one room (in which outbreak of fire would create undue risk to occupants, either in the room or elsewhere in the building), but the system could comprise comprehensive detection throughout large areas of a building in which, for example, structural fire resistance is less than that normally specified for buildings of that type. The protection afforded by a Category L5 system may, or may not, incorporate that provided by a Category L2, L3 or L4 system.

3.3 Category P (Property)

Category P systems are automatic fire detection and fire alarm systems intended for the protection of property. They are further subdivided into subcategories P1 and P2 in which the lower number represent a higher level of coverage.

a) Category P1: systems installed throughout all areas of the building. The objective of a Category P1 system is to offer the earliest possible warning of fire so as to minimise the time between ignition and the arrival of firefighters.
b) Category P2: systems installed only in defined parts of the building. The objective of a Category P2 system is to provide early warning of fire in areas of high fire hazard level, or areas in which the risk to property or business continuity from fire is high.
NOTE *The defined parts of the building might be as few as one or more rooms, or as extensive as, for example, complete floors of the building.*

3.4 Category selection

If a system is intended to fulfil the objectives of more than one category of system, then the system needs to conform to the recommendations for each of the categories.

Decisions regarding the appropriate category of system for any specific building rest with the authority responsible for enforcing legislation in the building. Annex A of BS 5839-1 Fire detection and fire alarm systems for buildings – Part 1: Code of practice for design, installation, commissioning and maintenance in non-domestic premises provides informative examples of where different categories of system might be installed including:

Premises	Categories
Offices, shops factories, warehouses and restaurants	M or P2/M or P1/M
Sleeping accommodation such as hotels, hostels, and student halls	L1 or L2
Hospitals	L1
Schools	M or M/P2 or M/P2/L4 or M/P2/L5
Prisons	M/L5

The policyholder is advised to agree the category selection with their insurer as there can be great variation of trade risk within these categories.

4 Types of fire detection and alarm systems

Whilst many of the detector types described are commonplace and well understood, many other technologies have been developed to cater for the needs of high-risk environments including marine, offshore, and complex manufacturing and storage situations. Building alarm systems are notorious for false actuations due to the simple single component detectors used and this level of disruption cannot be tolerated in many critical situations. Newer detection technologies and the reimagination of existing ones have resulted in great advances in the accuracy and reliability of systems which can also provide much more information to support the situational awareness needed to efficiently resolve fire situations. This section discusses the communication infrastructure into which detectors are embedded and their relative merits are discussed.

4.1 Conventional Fire Detection and Alarm Systems (FDAS)

A conventional or two-state detector is a simple device which gives one of two states relating to either normal or fire alarm conditions. Location of the fire is achieved by grouping detectors into logical zones. Each zone is wired separately to the CIE and the fire is located by reporting which zone the alarm is on. Identification of which detector has operated in the zone is made via an LED on the device. Point smoke detectors used in conventional systems must conform to the requirements of BS EN 54-7; point heat detectors to the requirements of BS EN 54-5; flame detectors to the requirements of BS EN 54-10; and manual break glass call points to the requirements of BS EN 54-11.

4.2 Addressable FDAS

An addressable system is one using addressable detectors and/or call points, signals from which are individually identified at the control panel. In an addressable system each detector independently signals its status back to the control panel. Since each detector has its own identity (or address), the control panel, in addition to providing the normal detection zone, may be configured to give a customer defined character message to each detector. This is especially useful to any observer who is not familiar with the layout of the site. The customised messages are usually displayed on a text and/or graphical display alongside the visual detection zone indicators. The use of addressable systems means that much more information about the spread of fire within a zone can be obtained.

4.3 Digital addressable FDAS

A digital addressable system is one which uses addressable detectors, each of which can give an output signal representing the value of the sensed phenomenon (smoke, heat, CO, IR, UV etc.). The decision as to whether the signal represents a fire or not is made at the CIE rather than the detector itself. Such systems have the capability to better interrogate the environment for factors that may adversely affect the performance of the system, such as dust and dirt, and it may reconfigure itself to use new thresholds for pre-alarm, alarm, and fault to reduce false alarms. The introduction of a pre-alarm capability i.e. smoke increase before the alarm threshold, would normally be reached, can result in an improved response to slow developing smouldering and electrical fires, and may instigate investigation and use of portable extinguishers earlier, and even before the fire manifests as flame. Another advantage of these systems over conventional and addressable fire detectors, where the sensitivity is fixed, is that each digital addressable detector can be made to emulate a normal, low, or high sensitivity detector by simple configuration of the software enabling the performance to be matched to location balancing detection delay against false alarm likelihood.

5 Types of detectors

As each type of detector responds to a particular fire product, the relative speed of response of the detectors is therefore dependent upon the type of fire being detected. As smoke is normally present at an early stage in most fires, smoke detectors are considered the most useful type available for giving early warning. Most fires, in their later stages, emit detectable levels of heat. Therefore, in areas where rapid fire spread is unlikely and environmental conditions preclude the use of smoke detectors (such as kitchens), heat detectors are a common alternative. Fires tend to produce carbon monoxide in situations in which there is insufficient ventilation to enable fire to burn rapidly and as such the detector is well suited to provide early warning of slow smouldering fires. Slowly developing and smouldering fires produce large quantities of carbon monoxide before detectable smoke aerosols and particulates reach smoke detectors in sufficient quantities to detect the fire. These detectors can often be used in applications in which heat detectors are insufficiently sensitive, but smoke detectors may cause false alarms from sources such as steam from a shower or smoke from burnt toast. In situations where a burning liquid, for example alcohol, paint thinner, etc. is likely to be the prime source of a fire, and flame is most likely to be the first indication a fire has started, then an infrared or UV flame detector could be incorporated into the system.

5.1 Point detectors

Point detectors are the most common form of detector used for the protection of buildings and as described above, their suitability depends upon the environment in which they are being placed to achieve the correct balance of reliability and speed of response. They are generally ceiling mounted to best access rising smoke, heat, and gases, or gain line of sight visibility of an area for flaming. The sensitive elements of detectors should normally be within 25-600 mm of the ceiling but for heat detectors this range is reduced to 25-150 mm.

5.1.1 Smoke (see also AFPG-32)

Most fires produce smoke in their very early stages which makes it a good indicator for detection purposes but there can be great variation in its density, particle size, and colour. As a general rule of thumb, the hotter a fire burns, the greater the number of small smoke particles that are produced, whilst low temperature decomposition results in more larger smoke particles. In respect of point smoke detectors, this can mean that some detection technologies suit certain applications better than others.

There are 3 principal types of point smoke detector: ion chamber, Optical, and High Performance Optical (HPO). ion chamber smoke detectors have a small radioactive source and a receiver, and resolve the presence of smoke by assessing the interruption of the emission. Working in much the same way, optical detectors use a light source that is scattered by the smoke. The amount of light reaching the detector is proportional to the density of the smoke. Optical detectors respond quickly to large smoke particles but are less sensitive to small particles that are less visible. HPO detectors work in the same way, but their sensitivity adjusts in accordance with the recorded gas temperature which can give them comparable performance to an ion chamber device. A challenge for all smoke detectors is false alarming against challenges that are like smoke, but not smoke (steam), or are smoke, but not a hazardous fire (cigarette smoke).

Duct probe units are specialist point smoke detection devices for the identification of combustion in ductwork. In this sometimes-harsh environment the sensor unit is mounted externally to the duct with gas samples delivered to it via a venturi probe located within the cross section.

5.1.2 Heat (see also AFPG-32)

Point heat detectors are normally used where the speed of response of smoke detectors is not required or where environmental conditions favour their use. There are two principal types of point heat detector, rate of rise, and fixed temperature. Rate of rise detectors are most sensitive but unsuitable for some applications where rapid fluctuations in temperature are commonplace like kitchens, and in such applications fixed temperature detectors are used.

5.1.3 Carbon monoxide (see also AFPG-32)

Carbon monoxide point detectors are particularly adept at detecting smouldering fires, and fires in confined spaces. They use an electrochemical cell to detect the presence of carbon monoxide which operates by oxidising the gas on a platinum sensing electrode. The ions produced by this reaction results in a current flow between electrodes which is directly proportional to the concentration of carbon monoxide present. The cell has a typical lifespan of 5 years. The threshold for alarm is typically around 40 ppm. Unlike smoke, carbon monoxide distributes itself uniformly within a volume and as such may be positioned with greater flexibility, although standards for fire detection purposes demand their placement as for smoke detectors.

5.1.4 Flame detectors (see also AFPG-35 and AFPG-32)

Infra-red flame detectors, unlike smoke and heat detectors, do not rely on the convection currents to transport the fire products to the detector and nor do they need a ceiling to trap the products, but they do need a line-of-sight to the flame source. The infrared emission from a flame stems from the hot molecules of carbon dioxide and this is characterised by a wavelength, and a flicker rate. Detection of both of these properties is used within an infrared detection device to reduce the likelihood of false alarms from other radiation sources. Detectors may also employ up to three sensors tuned to the fire wavelength, and wavelengths either side of that, to enable them to be more discerning and reduce false alarms especially in outdoor applications.

5.1.5 Combined – multi-sensor detector (see also AFPG-32)

Most false and unwanted alarms happen because a single combustion characteristic is being measured which can also look like many other things to the detector. By combining two or three of the aforementioned technologies into a single device, the accuracy of fire identification can be greatly improved, and the impact of many false fire scenarios ruled out entirely. By way of example, a device that measures smoke, carbon monoxide and heat will be resilient to triggering on shower steam because it will recognise the absence of heat and carbon monoxide. Similarly, cigarette smoke will lack enough components of combustion to warrant alarm raising. These 'high-integrity detectors' are certainly considered the future of detection and could greatly reduce false alarms and better support occupant and fire service response (see11).

5.2 Aspirating detectors (see also AFPG-31)

Aspirating detectors comprise a suction pump, detection chamber and extensive perforated pipe network distributed within the protected space. To allow for the impact of dilution of smoke, the detector employed is a hundred times more sensitive than those used in conventional point detectors. They have found particular application in computer suites where they are used to detect very small quantities of smoke in the air management systems, and in historical buildings where the visibility of installed fire detection systems needs to be low. Systems may also be augmented with additional gas detectors making them suitable for many industrial applications including UPS and battery charging rooms, cable tunnels and vaults, service tunnels, and underground car parks.

5.3 Optical beam detectors (see also AFPG-36)

Optical beam detectors are essentially uncased versions of point detectors with a supersized infrared light source and receiver that may be placed 10 to 100m apart to span a compartment, or be housed in the same unit with the beam bounced off a distant reflector. Optical beam detectors are specifically designed for use in large indoor areas such as warehouses, manufacturing workshops and aircraft hangars where the installation and maintenance of point detectors would be difficult. They have also found application in large historic buildings like cathedrals where interference with ornate ceilings must be avoided. During operation, the modulated infrared light beam is projected at the receiver and the signal is continuously monitored for change. Any smoke entering the beam will act to scatter the light, reducing the signal received, and will cause the system to go into alarm at a predetermined level for a period of time. Good alignment of the transmitter and sensor is essential with some systems employing auto-alignment capability to counter the impact of building movement.

5.4 Linear heat detectors (see also AFPG-33)

In fire protection applications that require the detection of heat over long distances, such as cable tunnels, cable trays, aircraft hangars and roof voids, it is more efficient to cover the area using a single linear detector, rather than many point detectors. Linear heat detectors act to measure the temperature over a length of cable, tube or fibre-optic which can span many kilometres in length, and some technologies can accurately pinpoint the location of the fire along the length. There are two principal types of linear detector: line-type and fibre-optic.

5.4.1 Line-type linear heat detectors (see also AFPG-33)

Line-type detectors come in two forms: non-integrating and integrating. Non-integrating heat detectors typically consist of a length of electrical cable with insulation of fixed melting point. At the nearest point to the fire, the insulation will melt causing the wires inside to short which is interpreted as an alarm signal and the CIE. Integrating line-type detectors are similar, but the insulation does not melt. Instead, the change of the electrical resistance of the cable is measured which varies with temperature. In both cases the detectors are unable to indicate where the fire is along the cable, and in terms of the integrating type, a large amount of heat in a small area would be required to create an alarm.

5.4.2 Fibre optic (see also AFPG-33)

The light transmission properties of fibre-optic cable change with temperature and this facet can be exploited to produce linear heat detectors of great length (up to 8km) and high accuracy (establishing temperatures every 1m along the cable). Using a pulsed laser, as the light source the backscattered light is analysed to produce data for the entire length of the cable. Alarm criteria may be made at a defined maximum temperature, defined maximum temperature rise, or rise above (difference) the mean cable temperature. With such data provision a single cable may be 'virtually' split into a number a reporting zones and is suitable for giving enhanced situation awareness as data may be plotted over building schematics to assist with interpretation of the fire event and spread.

5.5 Video detectors (see also AFPG-34)

Video detection systems analyse a live video stream for features that resemble fire, smoke, and even offsite (out of view) flicker (reflection on surfaces). Using machine learning computational methods, an analysis is made of the video feed to replicate how a human might interpret the same view. The pixel analysis considers colour, and movement, and upon identification of a likely fire, smoke plume, or offsite flame flicker, graphically bounds these areas with a coloured screen overlay and uses the information to raise alarms. Areas within view that may give rise to false or unwanted alarms can be masked out within the accompanying control programme. Some versions of the technology process the data from cameras centrally, and others have the processing built into the cameras themselves. Views of a fire from multiple cameras can be used to steer robotic suppression systems or shut-down machinery in the location of the identified fire.

5.6 IR array detectors (see also AFPG-35)

Infrared array-based detectors are very advanced, comprising an array of infrared sensors that can report fire location as an overlay to a camera view which is housed in the same device. Additional sensors within the device also confirm the alarm state and reduce false alarms. These sensors can cover very large areas and specific areas within view can be masked out if to reduce the influence of non-hazardous hot spots. These devices are designed to respond rapidly to fires that involve clean burning fuels that would be difficult to detect with smoke or carbon monoxide sensors. Views of a fire from multiple devices can be used to steer robotic suppression systems or shut-down machinery in the location of the identified fire and, as IR devices, they are immune to problems of poor lighting and smoke obscuration that video detectors are vulnerable to.

6 Installation planning

The Regulatory Reform (Fire Safety) Order 2005 (FSO) requires that any person who has some level of control in premises (normally the employer) must take steps to reduce the risk from fire, consider how to contain a fire should one break out, and make sure people can safely escape if there is a fire.

- All fire alarm designs should be based on an assessment of the risk
- All fire risk assessments should be carried out by a competent person
- Fire risk assessments must be reviewed regularly.

The fire risk assessment should include:

- Identifying fire hazards such as sources of ignition, fuel or oxygen
- Identifying all people at risk in and around the premises
- Evaluating the risk of a fire starting and the risk to people from a fire
- Removing or reducing fire hazards or risks to people from a fire
- Protecting people by providing fire precautions
- Recording the significant findings
- Preparing an emergency plan
- Informing and instructing any relevant people, including visitors
- Providing training for staff
- Reviewing the fire risk assessment regularly and making changes where necessary
- Keeping accurate fire risk assessment records.

The fire detection and alarm system has a central role to play in resolving risk. The following recommendations should be followed when designing a fire detection system:

- Establish the level of fire protection suitable to the premises type in agreement with the owner/occupier and relevant interested parties (life safety requirement, property protection, and business interruption)
- Document any reasons to justify variation of design
- Identify detection and alarm zones
- Raise specification document and building plan to show location of:
  - All manual call points
  - All types of detector
  - All sounders and visual alarms
  - Any other items of detection
- Include cable specification for each circuit
- State the system and equipment to be used
- Include details of other equipment that may be linked into the system to be specified
- Include measures incorporated to limit false alarms
- Provide a fire plan or cause and effect chart
- Include a signed design certificate.
- Include all relevant information in the Premises Information Box (PIB) that will assist those attending a fire to be effective.

7 Relevant standards

The EN 54 fire detection and fire alarm systems standard suite is a series of European standards that includes product standards and application guidelines for fire detection and fire alarm systems as well as voice alarm systems – there are 27 parts currently. The product standards define product characteristics, test methods and performance criteria against which the effectiveness and reliability of every component of fire detection and fire alarm system can be assessed and declared. Many of the product standards of the EN 54 series are harmonised standards under the Construction Products Regulation (CPR) EU 305/2011. Annex ZA of the harmonised standards specifies which sections of the standard apply for the purposes of the CPR. Annex ZA also describes the two-stage certification:

- certification of constancy of performance for the product (product certification) and
- certification of conformity of factory production control (FPC certification).

Whilst detector performance is evaluated against 8 test fire types with differing fire fingerprint properties, the absence of 'immunity tests' – challenges that the detector should NOT alarm against – is possibly holding back progress in respect of false and unwanted alarm management.

BS 5839-1 *Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises* provides recommendations for the planning, design, installation, commissioning and maintenance of fire detection and fire alarm systems for non-domestic premises. Recommendations for fire detection and fire alarm systems in domestic premises are given in BS 5839-6. It does not recommend whether or not a fire detection and alarm system should be installed in any given premises, nor does it provide any exceptions for non-domestic premises which are under construction. The other parts of the BS 5839 series are as follows:

- BS 5839-3 *Specification for automatic release mechanisms for certain fire protection equipment*
- BS 5839-6 *Fire detection and fire alarm systems for buildings - Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises*
- BS 5839-8 *Code of practice for the design, installation, commissioning and maintenance of voice alarm systems*
- BS 5839-9 *Fire detection and fire alarm systems for buildings - Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems*
- PD 6531 *Queries and interpretations on BS 5839-1.*

The NHS Estates publications HTM 05-03 Part B (in England and Wales) or SHTM 82 (in Scotland) provide recommendations for fire detection and fire alarm systems in hospitals.

8 Schemes

BAFE and LPCB are independent fire safety registration bodies for the United Kingdom. They establish, develop and monitor schemes for UKAS (United Kingdom Accreditation Service) accredited third party certification for the fire safety industry.

BAFE manage and maintain a Scheme called BAFE SP203-1 which covers fire detection and fire alarm systems. This scheme exists to deliver quality using independent evidence that providers are competent to deliver design, installation, commissioning and/or maintenance of fire detection and fire alarm system services.

The LPS 1014 scheme operated by the Loss Prevention Certification Board (LPCB) is similarly aimed at ensuring that companies responsible for the design, installation, commissioning and servicing of fire alarms systems are competent and can provide a quality and compliant system to end users.

9 Alarm Receiving Centres (ARCs)

An Alarm Receiving Centre (ARC) is a purpose-built facility that monitors multiple companies' and buildings' systems for triggers; the most common being security, intruder and fire alarms. Within an ARC, teams of monitoring operatives constantly monitor the centre for any incoming alarms and take appropriate action if they do occur, such as calling for a response from the Fire Service or police response. ARCs have become an integral component of confirming fire alarms against a background of very high false and unwanted activations.

10 Means of avoiding false and unwanted alarms

Comprehensive recommendations for the management of fire detection and alarm systems for the reduction of false and unwanted alarms are given in RISCAuthority document RC47: *Recommendations for the management of fire detection and alarm systems in the workplace*. It is estimated that over 75% of all alarms raised are false or unwanted and this leads to an erosion of trust by occupants and the Fire Service which could lead to delays and result in increased risk to personnel and extent of damage to business and property. Many fire services no longer turn out to unconfirmed alarms, adopting processes to prequalify the need for attendance ('call challenging')..

11 11 FRS Response to Automatic Fire Alarms (AFAs)

In the face of budget cuts, Fire Services across the UK are focusing on reducing the resources given to the attendance of false and unwanted alarm activations. The means to achieve this are many and varied and include:

- Not turning out until notified by another means such as a 999 call
- Call challenging; phoning the premises to see if the alarm is legitimate
- Providing a reduced attendance in the first instance
- Proving a small vehicle response in the first instance.

Methods adopted are often different for day and nighttime due to sleeping risks and levels of occupation, and vary greatly for the type of building occupancy. As such, there are almost as many schemes as there are fire services. The RISCAuthority scheme monitors fire service response annually so that building owners have a good grasp on whether other actions are required on top of the activation of the detection and alarm system to notify fire service to attend.

Through the National Fire Chiefs Council guidance there is scope for 'high-integrity' systems to circumnavigate the need for call challenging – sprinkler system activations count as high integrity alarms.

It is critical that all building and business owners understand the role that good detection systems can play in getting the required response from the Fire Service when needed, and this is best done through close communication and cooperation.

12 Associated Active Fire Protection Guides (AFPG)

AFPG – 31 Aspiration Smoke Detection

AFPG – 32 Point Detection

AFPG – 33 Linear Heat Detection

AFPG – 34 Video Detection

AFPG – 35 IR Array Detection

AFPG – 36 Beam Detection