FIRECLASS

False Alarm Management
White Paper

Part 1

Johnson Controls

CONTENTS

Who is FireClass?

FireClass is a revolutionary new class of commercial fire detection products, and a world leading fire alarm system manufacturer and supplier. FireClass features the latest fire detection technology packaged as an easy to install, out-of-the-box, digital open-protocol solution.

Comprising a comprehensive range of fully approved, quality products, designed and manufactured in Europe, FireClass is designed to appeal to both the end user and installer.

The FireClass range of fire detection equipment comprises both analogue addressable and conventional systems with a full suite including fire alarm control panels and repeaters, smoke, heat, flame, carbon monoxide and multi sensor detectors, fire alarm sounders and manual break glass call points. FireClass also manufactures a range of fire suppression products including gas extinguishing control panels and manual release and abort call points.

Designed and engineered in Europe, FireClass technology is part of Tyco International, the world leader in fire and security solutions. Tyco has been specialising in fire detection control equipment for the last 50 years. Our team of expert engineers and designers have developed fire detection solutions for a wide range of environments from simple conventional systems to complex integrated systems for hazardous industrial installations.

This expertise and heritage has been responsible for innovative solutions over the years, including the first carbon monoxide fire detection technology for commercial environments and triple sensing technology. It is this expertise which has now been applied to FireClass technology bringing you – a new class of fire detection solutions designed to meet all your needs through a single supplier.

Purpose of the white paper

FireClass wishes to emphasise the importance of false alarm management within the fire and security industry. This is not just a focus on manufacturers, but also installers and end users. By reducing false alarms, ultimately fewer lives are put at risk and more lives would be saved each year. There is also a cost benefit for all businesses involved

in the supply chain. This reduction in costs can be refocused on product innovations providing more security and a safer work environment for all. FireClass has a number of innovations which can help manage and reduce the risk of a false alarm, which this paper will also highlight and provide further detail on.

The white paper is split into two parts, the first part was released on the 9 May 2013 and seeks to define the false alarm landscape. The second part focuses on the specific products and technologies that FireClass can provide to aid in the battle against false alarms.

What types of false alarms occur?

It is generally accepted there are a variety of false alarms which occur. Malicious false alarms are exceptionally frustrating for all parties involved. Although less prevalent in larger organisations, institutions such as schools, hospitals and other public areas such as train stations are still affected by malicious false alarms.
Fire alarm systems and their equipment are constantly being upgraded and innovated to reduce both the frequency and the damage these false alarms can generate. Some systems now allow for a visual confirmation of the fire before the fire service is notified and sometimes simply having protective screens, such as the ones FireClass manufactures, can reduce malicious false alarms instantly.

Depending on the design of your fire and security system, there are a number of ways to reduce malicious false alarms. The white paper will delve into specific technologies and products provided by FireClass provide can significantly help.

Looking at the layout of your fire alarm system can also help significantly. Conventional manual call points can be replaced with break glass call points, which will lead to a small drop in malicious false alarms. Hinged covers, dummy and real security cameras placed prominently near specific call points, can all help reduce the amount of malicious false alarms.

In certain fire alarm systems, Fire Services have introduced a delay in response and wait for audio or visual confirmation to verify the fire alarm is real. This method allows a Fire Safety

Officer to locate and inspect the area in the first instance. An addressable fire alarm system can help both the Fire Safety Officer and Fire Services to quickly locate potential fires and reduce the damage caused.

There will always be an element of false alarms raised that were backed by good intent. Far from discouraging individuals not to raise an alarm if they believe there is one, the entire industry should be focused on investing in as much awareness and training as possible. This will reduce false alarms but also ensure that real fire alarms are raised quickly and appropriately.

One other type of false alarm which generally occurs comes down to equipment, installation and servicing. FireClass cannot emphasise enough the importance of these three areas combined, not only in relation to false alarms but also for the very purpose they were intended for.

Common causes of false alarm include:

- Poorly maintained systems or lack of maintenance
- Badly designed or poorly installed systems
- Insect infestation
- Build-up of dirt and dust in smoke detectors
- Steam ingress into smoke detectors, typically from en-suite bathrooms in hotels
- Smoke from processes other than fire, welding is an example
- Aerosols and atmospheric pressures
- Cooking processes such as flambéing
- Theatrical smoke, dry ice, candles and incense
- Sudden heat ingress such as opening industrial oven doors
- Water ingress into electronics
- Diesel emissions on loading bays
- Cutting, welding and 'hot' work

This white paper will focus on the issues with which FireClass can actively help, as one of the leading fire detection and suppression companies in the world.

Are false alarms such a significant issue?

Taken from DCLG Fire Statistics: Great Britain April 2013 to March 2014

Fires and false alarms

The total number of fires attended in 2013-14 was 212,500, continuing the generally downward trend of the last 10 years. There was though a 10% increase on 2012-13, but this previous year had been unusually low due to wet weather conditions. The increase is mainly due to a large increase (around 20%) in outdoor fires.

The number of false alarms fell by 3% to 293,100 in 2013-14 from 301,400 in 2012-13.

According to the DCLG, Fire and Rescue authorities attended a total of 505,600 fires or false alarms in Great Britain in 2013-14. This is 2% higher than in 2012-13, but less than half that of ten years ago (table 1.1).
In addition, the Business Sprinkler Alliance estimate the British economy has lost £1 billion in GDP and 5,000 full-time jobs through preventable fires in commercial warehouses over the last five years.

When you consider the financial implications to businesses and services that are also affected by downtime through false alarms, the costs suddenly start spiralling incredibly. It has been estimated in some circles that the real cost in terms of service to the Fire Authorities is calculated at £300 for every half hour they are occupied. Because of the Localism Act 2011, local Fire Authorities can now charge following persistent false alarms, and facilities managers need to be aware of this new cost resulting from poor management of their fire alarm system. The costs of production loss coupled with potential fines will quickly dwarf the cost of managing and maintaining a fire detection system.

Cost is not the focal point of the issue. The fire and security industry is one of the most unique frameworks within the world. Rather than a purely competitive zeal for business, the industry is dedicated to providing the most comprehensive service towards protecting lives and property that is possible. False alarms result in Fire

Table 1.1: Fires1 by location and false alarms, Great Britain, 2000/01 - 2013/14p								
Year	Total fires & false alarms	Total Fires	Building Fires			Outdoor Fires[3]	Chimney Fires	False Alarms
			Total	Dwelings[2]	Other			
2000/01	895.0	444.8	107.3	67.4	39.9	323.9	13.6	450.2
2001/02	992.2	525.0	108.8	66.5	42.3	404.3	11.9	467.2
2002/03	949.3	502.8	97.8	59.7	38.1	395.0	10.0	446.5
2003/04	1,027.9	571.6	102.2	61.7	40.4	460.3	9.1	456.3
2004/05	845.0	412.5	92.9	57.1	35.8	311.2	8.5	432.5
2005/06	831.6	408.9	89.7	55.9	33.8	309.8	9.4	422.7
2006/07	837.7	411.3	85.5	53.8	31.7	318.2	7.6	426.4
2007/08	769.7	364.1	79.6	50.4	29.2	276.0	8.6	405.5
2007/09	694.2	309.3	73.5	47.5	26.1	225.1	10.7	384.9
2009/10	653.6	299.3	73.7	47.2	26.5	215.8	9.9	354.3
2010/11	626.9	288.0	74.1	46.0	28.1	203.9	10.0	338.9
2011/12	586.0	272.8	71.5	44.4	27.1	193.6	7.7	313.3
2012/13r	494.1	192.7	63.5	41.6	22.0	119.7	9.4	301.4
2013/14p	505.6	212.5	61.3	39.6	21.7	143.5	7.7	293.1

1 Figures in thousands and figures are rounded and the components do not necessarily sum to the independently rounded totals.
2 Includes caravans, houseboats, mobile homes and other non-permanent structures used soley as a permanent dwelling.
3 Primary and secondary fires. Exclude fires in derelict buildings (which are included in "Other Buildings" here, but are shown separately as "Outdoor Fires" in Annex table 1c).

r=revised; p=provisional

Services not being able to attend genuine emergencies or fires, potentially placing people at unnecessary risk.

There are significant risks for both the Fire Service and the general public in attending a fire alarm. Due to the nature of the life or death situations they deal with, the Fire Service often attend fire alarms under blue light condition, involving high speed driving of a large fire engine which presents danger for other road users. For a false alarm situation, these additional dangers are unacceptable.

False alarms can also breed complacency. If a workforce is constantly being evacuated due to false alarms, when a real alarm actually occurs it can generate panic and lives are put at risk due to not taking the situation as seriously as it should be.

Reducing False Alarms

Fire and Rescue Services are taking different measures to cut the costs associated with attending false alarm calls. Some are reducing the number of fire engines sent while others have stopped mobilising altogether in response to automatic fire alarms. There are ways in which industry can ensure that the Fire and Rescue Service are only called out to a genuine fire. The use of today's technology together with training, and a good system design, can help minimise the possibility of a false alarm.

There are many reasons alarms go off accidentally. The alarm may be poorly installed or it could be the incorrect system for its purpose. The device could also be fitted at the wrong height or installed in the wrong place. Importantly, if there are issues with the alarm at installation, then unless these are addressed the false alarms will continue to take place.

There are many sources of advice available to those responsible for fire alarm systems. The Fire Service plays an important role but manufacturers and installers of fire safety equipment can also be a great source of information. This is where FireClass seeks to provide our ethical obligation to help where we can. This training and advice can go a long way in helping to reduce false alarms.

Today's fire detection and alarm systems offer a number of techniques that reduce the chance of the Fire and Rescue Services being called to a false alarm.

Examples of these include:
- Using a pre-alarm setting on the detection system. This is where the system is set up to provide an early warning of a potential problem, thus allowing action to be taken typically by a Fire Warden before a full alarm condition is reached.
- Another approach is to use a coincidence function. This is where two separate detection devices are required to be in alarm before a full evacuation and the Fire and Rescue Service are called.
- Other options include the use of a time delay. The initial device in alarm alerts the Fire Warden who carries out an investigation. If a genuine fire is found, a full evacuation can be raised by breaking a call point.
- A fail-safe is built into the system, allowing for a short time frame before the Fire Services are automatically contacted.

Clearly every building is different in both design and usage and these are just a few examples of the many techniques available to minimise false alarms from automatic fire alarm systems

Fire Safety and the Law

Compliance

The Regulatory Reform (Fire Safety) Order 2005 changed the legal frame work for fire safety in England and Wales. This law covers "general fire precautions" and other fire safety duties that are needed to protect "relevant persons" in case of fire in and around most premises.

The Fire Safety order is a Fire Risk Assessment based approach where the Responsible Person for the premises must decide how to address the risks identified, whilst meeting certain basic requirements.

For the fire detection and alarm system this often refers to;
BS5839-1: Fire detection and Fire Alarm Systems for Buildings; code of practice for system design, installation, commission and maintenance, establishes the following are requirements:

- Current Risk Assessment
- Log Book that records the date and time of the weekly tests, any faults or false alarms. If any work is conducted on the system this also needs to be recorded along with details of who carried out the work
- BS 5839-1 G1 Design Certificate which specifies the fire plan, drawings detailing the category and level of protection and any variations agreed with applicable parties
- BS 5839-1 G2 Installation Certificate, including a set of 'as fitted' drawings
- BS 5839-1 G3 Commissioning Certificate, equipment manuals with user instructions
- Alternatively, a G5 Certificate in place of the G1, G2 & G3 that includes all the additional material listed above
- BS 5839-1 G4 Acceptance Certificate that confirms the date of handover
- BS 5839-1 G6 Inspection & Servicing Certificate(s) that record all tests and checks made at each service visit since original installation – handover
- BS 5839-1 G7 Modification Certificate identifying any work undertaken on the system since the date of handover

The prosecutions for failing to respect the law in relation to fire safety and the subsequent punishments and or prison terms being handed out, are becoming significant and highlight the real life implications of failing to take every precaution possible in preventing fires and saving lives.

FireClass has commissioned a Consultants Guide in respect of BS5839-1. The Code of Practice for Fire Detection and Alarm Systems for Buildings is a detailed and comprehensive document which requires careful reading to fully understand the requirements and latest approach to ensuring the safety of buildings and their occupants from the ever present threat of fire. Please download a free copy here.

Responsible Person

The first thing on the agenda for any Responsible Person is to ensure that a suitable fire alarm is installed and is being maintained as per the British Standard. Research conducted by the Department for ¬Communities and Local Government found that of the 16,400 dwelling fires last year, 37% occurred in places that lacked an alarm. A further 25% occurred in places where a fire alarm was present but non-operational.

Each system must have the appropriate ¬detectors for the environment they are installed in.
Further guidance on the type of detector for the environment can be found in the Fire Class Consultants Guide.
The Responsible Person nominated to supervise your fire detection and fire alarm system should have received appropriate training. That person will have the skills, knowledge, or experience needed to make sure that:

• The system is properly maintained and remains in good working order.
• Faults are dealt with quickly and efficiently
• Persons who have to take specific action when a fire alarm goes off have appropriate training
• All false alarms are investigated and action taken to solve any problems
• All actions are recorded in the systems log book

Many unwanted fire alarm signals are caused by building work being carried out in the vicinity of fire detectors. The Responsible Person for your company should ensure that staff and visiting contractors are made aware that the building is fitted with an automatic fire detection and fire alarm system.

Where possible, permanent notices should be displayed at the entrance to all areas in which detectors are sited. A suitable text is:
"This area is protected by automatic fire detectors. Before undertaking any work involving heat, flame, dust or sparks, clearance must be obtained from (name of Responsible Person)."

The Responsible Person must also ensure that maintenance or other work is carried out on the system only by a competent person. If the person nominated needs training, you can get further advice from:

• The company that installed or maintains the system
• Fire Industry Association www.fia.org

The appointed Responsible Person must ensure that the risk assessment of the premises is carried out and crucially regularly updated at least once every year. The Responsible Person should also ensure that the fire alarm system is maintained by a competent and trained servicing organisation. The UK Government fire risk assessment guides recommend that "Third party certification schemes for fire protection products and related services are an effective means of providing the fullest possible assurances, offering a level of quality reliability and safety that non-certified products may lack".
All FireClass products are dually certified and we would recommend that any servicing work is carried out by a BAFE registered company (British Approval Fire Equipment www.bafe.org.uk).

Part of the risk assessment must ensure that the correct type of detection is installed throughout the premises and it is applicable to manage the risk from fire and from false alarm potential. Any BAFE registered fire alarm company will be happy to provide advice. In the event a building has a changed purpose or in the event building work is carried out and the building is extended or even downsized, all interested parties must be consulted. There is a likelihood the fire alarm system will need to be altered and it is imperative that these changes are made.

The building work undertaken or the new purpose has potential massive implications on a system, determining whether an addressable or conventional system is most appropriate, or whether any building work affects any of the existing fire detection equipment and crucially whether all parts of the building would be covered by the fire detection equipment. The wiring of the systems is likely to be affected, buildings with ducting may require different types of sensors to be applied and the type of detector may no longer be appropriate. One of the areas often overlooked is the cause and effect programming as the risk from both fire and false alarm may change.

Interested parties can include, but are not limited to;
• The Manufacturer of the fire alarm system
• The fire alarm Servicing Organisation
• Fire Prevention Officers,
• Insurance Organisations
• Facility Managers
• The Fire Services
• The Building Firm
• Mechanical Engineers

The Responsible Person should ensure that the alarm is regularly tested and indeed the fire plan for evacuation procedures is regularly undertaken. Weekly sounder tests are a common occurrence in most buildings and the responsible person should ensure that those persons using the fire alarm system are properly trained. This stops needless false alarms and call-outs resulting from procedures not being followed and for inadvertent false alarms being triggered by improper use of the fire alarm system.
One of the common reasons for a false alarm being triggered is systems becoming old and obsolete. Whilst most individuals would regularly update their electronic equipment such as mobile phone or television over time, fire alarm systems can be significantly overlooked. Crucially this has a bearing on management of false alarms. Technology advances at a rapid rate and indeed if it was possible to provide every organisation and building with up to date technology in their fire alarm system, the issue of false alarms would not be as prevalent as it is today. Modern fire equipment is also based on much more complex technology than equipment which was considered new 10 years ago. The complex technology used in fire detection equipment can include the following in the fire alarm system programming to reduce false alarms;

• Time delays
• Day/night modes
• Co-incidence detection and verification

Servicing as a method of reducing false alarms

The role of the Servicing Organisation and or Engineer is just as important as that of a Responsible Person. A suitable risk assessment should determine the frequency with which the system needs to be serviced. Factors such as the size of the fire alarm system, complexity level, the risk level covered by the fire alarm system, all influence the frequency for how often a fire alarm system should be serviced. At the minimum this should be twice a year, rising up to 4 times. Regular servicing ensures that the risk of a false alarm is reduced. At each service the Engineer will check and test all operations of the control elements of the system. This includes not just the fire alarm control panel and the performance of the system but also the power supplies and fire alarm sounders. Reputable service organisations also test 25%-50% of all the devices such as detectors which are checked yearly. This level of detail in servicing reduces the risk of equipment being faulty which in turn reduces the level of false alarms. The Engineer will also check the false alarm record to determine:

• The rate of false alarms expressed as the number of false alarms per 100 detectors
• Whether two or more false alarms have arisen from any single device
• Whether any persistent cause of false alarm can be identified
• The dirt build-up levels in all detectors, and will change any which are going out of operational parameters

If warranted, the Engineer and Service Organisation will carry out further in-depth investigations into persistent false alarms and try to establish the technical or environmental causes. FireClass recommends always erring on the side of caution. In the event of a real life emergency the possible ramifications of not doing so are disastrous. The industry has also witnessed some of the highest fines issued against organisations and individuals neglecting their duties. Whilst FireClass seek to manage and reduce the frequency of false alarms, failure to maintain and monitor systems properly can result in extremely costly cases.

Selected case studies taken from Building 4 Change (http://www.building4change.com/page.jsp?id=1111)
Co-Operative Group, 26 Apr 2010

The world's largest consumer-owned business, the Co-Operative Group, was fined over £200,000 after pleading guilty in Southampton Crown Court to serious fire safety breaches at their store in Southampton.

The prosecution by Hampshire Fire and Rescue Authority took into account six breaches of fire safety under the Regulatory Reform (Fire Safety) Order 2005. The Co-Operative Group was fined £35,000 for each of the six offences and ordered to pay a total of £210,000, plus costs in excess of £28,000 to Hampshire Fire and Rescue Authority.

Christopher Morris, 23 Dec 2010

A former retained firefighter who failed to maintain a fire alarm in a care home was fined £11,000, including costs, in what is thought to be the first case of its kind.

Christopher Morris, 56, was fined £2,500 for each offence and £6,000 in costs for failing to maintain a fire alarm system at a care home in Trafford, Manchester, to a recognised standard and failing to inform the owners of the home of the deficiencies in the system.

Morris is believed to be the first fire alarm engineer to be prosecuted as a Responsible Person under the Regulatory Reform (Fire Safety) Order 2005. At the previous hearing the bench at Trafford Magistrates Court decided it did not have sufficient powers to deal with the case and what they described as 'culpable neglect' by the defendant.

Lee Pemberton, 28 Oct 2011

A landlord and his property firm were ordered to pay more than £33,000 for breaching fire safety legislation.
Lee Pemberton, a director of PemCo Investments Ltd, pleaded guilty to seven offences relating to a property above a shop, in Lune Street, Preston.

Lancashire Fire and Rescue Service Chiefs said Pemberton put residents at risk of death or serious injury if there had been a fire in the house of multiple occupants. The offences included failing to provide appropriate fire detectors and alarms, a lack of a suitable fire risk assessment and an unsuitable system of maintenance for the building.

Pemberton, who had already been prosecuted by the Fire Services for previous breaches of the Regulatory Reform (Fire Safety) Order 2005, was fined £1,000 for each offence at Preston Magistrates' Court. He was also ordered to pay £500 costs.

PemCo was also fined £3,000 for each offence, totalling £21,000, and ordered to pay £5,520 costs.

David Moseley and DM Care 10 Apr 2013

A record fine has been handed to a care home owner who put residents at risk through fire safety breaches.

David Moseley and his firm DM Care were given a £35,000 fine after local Fire Services found several breaches of regulations following a fire last year. The Ambassador Care Home in Lytham Road, South Shore, was found to have a Santa's Grotto blocking an exit route by emergency services when the blaze started in January 2012, Blackpool Gazette reports.

Furthermore, no approved fire protection systems and alarms were in place, therefore leaving residents' lives at risk. While nobody was hurt in the conflagration, 40 people in the care home had to be led to safety by fire-fighters during the incident.

In a court case held last month, DM Care was given a record fine for an incident such as this in Lancashire and the maximum that could have been imposed.

Conclusion

False Alarm Management White Paper Part 1 issued by FireClass focuses on issues within the industry. The second part of this paper focusses on areas which FireClass can specifically help with, in the form of training, and the products and technology that go into FireClass to make it the market leader in terms of preventing false alarms.

False alarms represent the most significant drain on the Fire Services. For organisations, they cause operational and financial implications which are a needless drain on their own resources. As can be seen, false alarms have been reducing for 10 years, not least due to the legislation requiring the appointment of an appropriate person and their duties, but also the technology employed in the fire detection equipment which has been advancing at a rapid rate. Organisations, by making a compar¬atively small investment in a system with features built in to stop, or at least delay, an alarm activating, will instantly see the far greater benefits when it comes to the safety of our communities.

Sources:

FireClass Website
www.fireclass.co.uk

Building 4 Change Website
www.building4change.com

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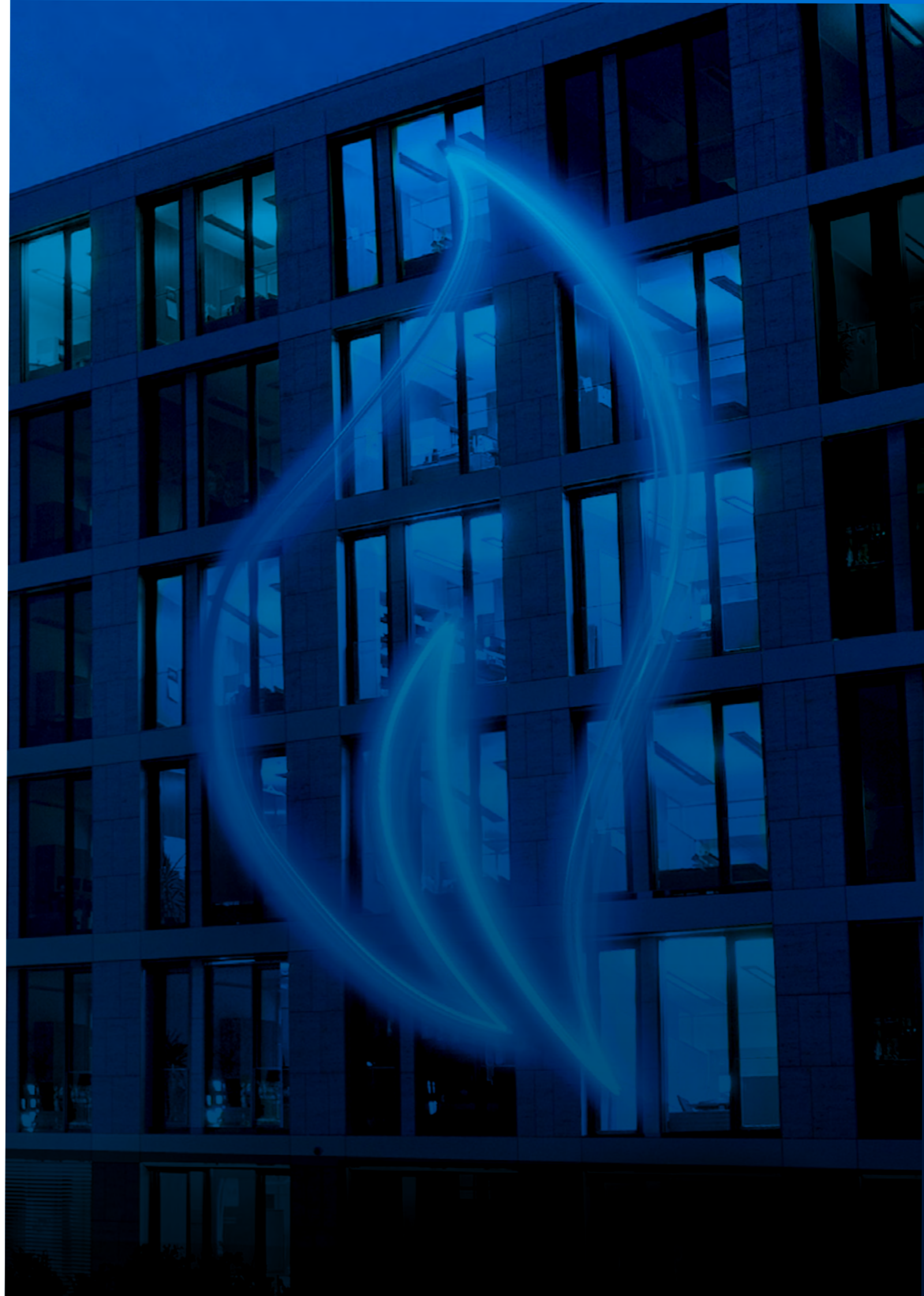https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6762/568234.pdf

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