



1.1 INTRODUCTION

- 1.1.1 This guidance forms part of the toolbox for reducing Unwanted Fire Signals (UFS) and should be read in conjunction with the policy F7 – Unwanted Fire Signal Reduction.
- 1.1.2 After assisting the Responsible Person (RP) to investigate the cause of an actuation, it is important that appropriate advice is given to help the RP to prevent the same circumstances that led to the UFS from happening again.
- 1.1.3 Each of the following sections details the common causes of UFS and outlines the appropriate advice that can be given to prevent the UFS from happening again.

1.2 HUMAN RELATED UFS

False alarms in this category relate to incidents where the actuation of the fire alarm system originated from human error. This could be purely accidental or through the action or inaction of a person which leads to the actuation of the fire alarm system. Causes under this category include accidental, testing, smoking and cooking or toast.

Accidental/Carelessly Set Off

- 1.2.1 Break glass call points are a common cause of UFS. Where there is significant potential for malicious false alarms or accidental breakage, consideration needs to be given to the location of manual call points. Reducing the number of call points may be an option or protecting the call point with a plastic lift up cover will help reduce this problem.
- 1.2.2 Other impact type accidental causes include detectors hit by large objects such as ladders being carried through the area or being hit by boxes placed on shelves in store rooms which are too close to ceiling level. Shelving systems are often built to the maximum permissible height below the detector which is 300mm, this then leaves a convenient space where items can be stored and where detectors are prone to damage. The restricted space around the detector also reduces the airflow leading to a possible delay in the actuation in a fire situation.
- 1.2.3 Probably the most common accidental cause is due to contractors working in spaces protected by the various forms of smoke detection. Contractors can often cause problems because they are unfamiliar with the premises and unaware of the presence of automatic detectors. The RP is also often ignorant of the work processes required to complete the task undertaken by the contractors. This work may be inappropriate to the detector protecting the area, especially where 'hot work' procedures, including welding or soldering, are involved. The generation of large amounts of dust such as plaster dust from building work can also give rise to false actuations of fire alarm systems.





Guidance on permit to work systems is available from the Health and Safety Executive (HSE)

- 1.2.4 The introduction of a 'Permit to Work' system reduces the tendency for systems such as fire alarm systems to be overlooked during the work. The permit, usually consisting of an A4 size form, enables the contractor and the RP to discuss the work and identify the possible problems, including safety issues, and likely actuation of the fire alarm system prior to the commencement of the work. It may be necessary to isolate a fire alarm zone or specific smoke detector(s) while the work is undertaken, this will prevent UFS from occurring.

Testing and Other Maintenance

- 1.2.5 System testing and maintenance is a common cause of UFS, this problem often occurs where a system is remotely monitored through an Alarm Receiving Centre (ARC) and the person carrying out the weekly test has neglected to inform the ARC that the system is about to be actuated.
- 1.2.6 This problem is not confined to the occupier doing the weekly test as many UFS are reported as 'engineers working on system'. This is especially worrying because if the engineers are failing to inform the ARC that the system is going off-line for maintenance, do they also fail to inform the ARC to put the system back on-line when the maintenance is finished?. When advising the RP, stress the importance of following set procedures when carrying out testing and maintenance of the fire alarm system.

Smoking

- 1.2.7 Smoking in non domestic buildings became illegal in England on July 1st 2007 therefore this type of call should be a thing of the past. However, NFRS has attended several calls since that date that were attributed to smoking under detector head. It should be pointed out to the RP that it is an offence to smoke in a public building and that any breach carries a maximum fine of £2,500. The law is enforced by the local authority and NFRS may consider informing them of the incident.

Cooking/Toast

- 1.2.8 Approximately 13% of all the UFS attended by NFRS each year are as a result of fumes from cooking actuating a fire alarm system. Whilst toasters are the most common contributor to this type of incident, they are by no means the only cause; fumes from microwaves, pans on cooker hobs, food in ovens and even steam from kettles all contribute to a significant number of UFS calls we receive each year. **Cooking should not be left unattended.**
- 1.2.9 Smoke detectors including optical, carbon monoxide and ionisation chamber are necessarily very sensitive and can be actuated by tiny amounts of airborne contamination. Therefore, where the normal cooking process has activated the fire alarm system i.e. nothing was burned; there was a possible fault with the fire





alarm arrangements or management of the premises. The faults possibly being:

- Incorrect detector type (unsuitable equipment)
- Incorrect detector position i.e. too close to kitchen
- Inadequate ventilation
- Door to kitchen left open

1.3 SYSTEM RELATED UFS

UFS in this category relate to actuations due to some kind of fault with the fire alarm system. The recognised faults include poor maintenance, faulty systems, damaged components, and incorrect position of components, unsuitable equipment, or a lack of third party accreditation. The above failures can apply to any type of fire alarm system.

Poor Maintenance

- 1.3.1 Dirty detector heads and/or damaged indicator panels and call points can often indicate poor maintenance. A system that is poorly maintained will produce more UFS than one that is regularly serviced. If it is suspected that dirty detector heads are a cause of UFS at the premises, ask the RP to have the heads cleaned or replaced.
- 1.3.2 Correct testing of the alarm system is a very important part of the maintenance of the system. Ask the RP how and when the alarm is tested. If there are any doubts regarding the maintenance and testing, remind him/her that there are maintenance guidelines contained in **BS 5839 part 1 2013**, current guidance indicates that the fire alarm system should be inspected by a competent person on a **6 monthly basis**. Any system not regularly maintained to this standard does not conform to the standard.
- 1.3.3 The occupier's fire safety logbooks should show all weekly fire alarm tests (undertaken by the RP or nominated person), periodic maintenance (carried out by the alarm maintenance contractor) and any system actuations, false or otherwise. The maintenance contractor should provide the occupier with a certificate of maintenance (or receipt stating the nature of the work carried out) after each maintenance event. These should be available for inspection on the premises.
- 1.3.4 If no logbook can be provided, inform the RP of the need to maintain such a record along with other records such as staff training, the maintenance of fire-fighting equipment and emergency lighting.

Note: whilst operational personnel have a right to enter premises under section 44 of the Fire and Rescue Services Act 2004, they do not have the right to demand access to documentation such as fire safety records. Fire crews are also not empowered to enforce the requirements placed on the RP by the Fire Safety Order 2005. **Asking to see records should therefore be termed as assisting the RP to reduce his/her UFS.**



Faulty or Damaged Equipment

- 1.3.5 Any faulty components have the potential to produce an UFS. Damaged units such as detectors and call points can be easy to spot and the advice should be to have the component replaced as soon as possible. System faults can be more difficult to determine; 'fault on system' is a rare occurrence although many UFS are recorded as such. Alarm engineers suggest that unless the fault lamp is illuminated on the panel, then the system is working fine.
- 1.3.6 Where the fault light is illuminated, an appropriate question to ask is; why was the fire service called to a system fault. Even if the alarm system is remotely monitored, the RP had the opportunity to contact the fire service to confirm the cause as a false alarm.
- 1.3.7 If there is a lamp showing on a detector, then it is most likely that an event happened that the detector registered as a fire, talk to the RP to establish what the area was being used for at the time of the actuation, or talk to the persons who were in the area at the time. If this does not answer the question, look for other possibilities such as open windows and ventilation shafts.
- 1.3.8 If at the end of the investigation there is still no cause that can be identified, advise the RP to have the system checked. Where the actuation was due to system fault or other faulty or damaged equipment, remind the RP of their responsibility to maintain the system in an efficient working order therefore they should contact an engineer in order to resolve the problem as quickly as possible.
- 1.3.9 If there is any doubt that the system is being suitably maintained, ask to see the premises fire alarm logbook to check whether the system is being maintained and tested. Where previous false alarm signals due to system faults had been noted, check the details are entered in the logbook and an engineer had been called to inspect and rectify any fault(s). (See Note in 1.3.4 above)

Note: there is no requirement for personnel or appliances to remain in attendance awaiting the arrival of a fire alarm engineer.

Incorrect Positioning

- 1.3.10 It is essential that the detector type, and its position is appropriate to the use of the area it protects; the wrong type of detector or a poorly located detector is much more likely to give a false actuation than the correct type appropriately positioned.
- 1.3.11 Each detector should be correct for the area it protects and the likely fire type identified in the Fire Risk Assessment. Accordingly, as the RP is responsible for the carrying out of the Risk Assessment, he/she should be familiar with the various detectors protecting the premises.





- 1.3.12 Most manufacturers adopt a single ‘house style’ for all their detectors which makes identifying the type of detector quite difficult. If the RP is unsure as to which type of detector protects each space, advise them to consult with the alarm maintenance engineer to determine each detector type and then either indicate each type on the building plans located next to the alarm panel or mark each detector cover to identify its type.

1.4 CONTAMINANTS

Activations under this heading are confined to smoke type detectors and the atmospheric type effects that can falsely activate them. Airborne contaminants include insects, steam, chemicals and aerosols and dust.

Insects

- 1.4.1 Whilst insects can be a common cause of UFS during the summer season, it is the Thrip fly that presents the biggest problem. The harvest, which usually takes place July to August, means that countless billions of cereal Thrips (Latin name *Limothrips Cerealium*) are made homeless and take to the wing in search of a new home. The Thrips, also commonly known as thunder flies and storm flies, are typically less than 2mm in length and less than half a millimetre wide and therefore have no problem penetrating the surrounding mesh that provides the only defence for the smoke chamber in both optical and ionisation type detectors.
- 1.4.2 A known cure for the problem is to attach a pet flea collar to the detector; the insecticide impregnated material contained in the flea collar has proven to be an effective deterrent against insects including Thrips. The collars usually have an effective lifespan of 6 months so fitting the collars around the end of April should protect for the whole of the summer. As an alternative to the flea collar, a thin smear of citronella oil around the whole of the detector may also provide an effective deterrent but will need to be re-applied regularly to maintain protection.

Steam

- 1.4.3 Steam related calls attended include steam from kettles in offices, food trolleys in hospitals, industrial processes in factories and showers in hotels. Optical type smoke detectors are most commonly affected by steam in the atmosphere.
- 1.4.4 Kettles usually do not produce enough steam to activate a detector unless the room is very small or the detector is directly above the kettle. Advice to the RP would be to have the kettle moved to a kitchen area protected by a heat detector.
- 1.4.5 Food trolleys are commonly found in hospitals and care homes, they can be heated from within and therefore by the time they reach the wards the steam has filled the void under the cover and is then released the moment the cover is removed. Well managed hospitals and care homes have identified this problem and mark the floor with tape to indicate a place that is far enough from the

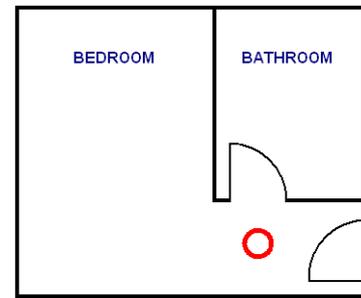




nearest smoke detector to prevent escaping steam from causing a false activation. Appropriate advice should be given if it appears that 'safe areas' have not been marked or if the system is not being enforced.

- 1.4.6 Steam from industrial processes such as ovens can become a problem where a process has been introduced to the space without taking the detection system into consideration. The choices are to move the process, move the detector or change the detector type. All options will require a review of the fire risk assessment and changing/moving the detector will necessitate consultation with the alarm engineer. Possible alternative detectors are heat, carbon monoxide and detectors which combine more than one type of detective element. Most modern detectors incorporated into addressable systems can be programmed to take account of background contamination and therefore the problem can be addressed by simply reprogramming the detector.

- 1.4.7 Steam from showers is a common problem in hotel rooms with en-suite facilities. Often the smoke detector is sited away from the living area to prevent false actuations due to cigarette smoke. The alternative position usually places the detector within the passage way leading to the front door adjacent to the en-suite door as can be seen in the diagram.



- 1.4.8 Since the introduction of the smoking ban, many hotels (not all) have introduced a blanket ban on smoking, advice now is to re-site the smoke detector away from the bathroom door so it not affected by steam when the door is opened.
- 1.4.9 Many UFS originate from aerosols being used in spaces protected by smoke detection. Fly sprays, hair sprays, air fresheners and deodorants all contribute to UFS incidents.
- 1.4.10 In most business premises it would be relatively easy for the RP to impose a ban on aerosols because of the risk of activation of the alarm system. There are alternatives to spray-type air fresheners and insect sprays. Hair sprays used in hair salons should be carefully used to avoid the area directly below a smoke detector. Cleaning staff in particular should be made aware that aerosol sprays used near detectors could cause false alarms.
- 1.4.11 In domestic accommodation such as flats and sheltered housing it is not possible to ban the usage of aerosols, actuations due to hair spray can be reduced by ensuring the detector is situated away from any mirror or the mirror is situated away from the detector. Prevention of UFS for other reasons in this category can be achieved through education of the residents although this method is seldom successful.





Dust

- 1.4.12 Fluff, dust, cobwebs and fly, in the case of a hosiery factory, can all contribute to increased rates of UFS. If you suspect that dust was the cause of the UFS, talk to the RP, stress the importance of good housekeeping, and ask to have the maintenance contractor clean the heads.

1.5 EXTERNAL CAUSE

- 1.5.1 External causes of UFS such as power surges, storms and water supplies are a rare occurrence and not usually within the RPs sphere of control. There is therefore little that he/she can do to prevent the problem. Fluctuations in the electricity supply, if persistent, should be investigated by a qualified electrician, similarly if the system is prone to actuating in storm conditions then it may be worth having an electrician check the building's electrical earth.
- 1.5.2 Fluctuations in water supply are likely to trigger a sprinkler system's flow or pressure switch leading to a false alarm actuation. If the problem is persistent, the RP should get advice from the sprinkler engineers.

1.6 UNKNOWN

When assisting the RP to investigate the cause of an actuation, the normal course of action would be to visit the area where the detector or call point has actuated. Actuations of call points are more easily determined, possible causes being accidental operation, actuation by persons believing that fire has occurred (false alarm, good intent) and faulty equipment.

- 1.6.1 Actuations of detectors can be more difficult, a detector with its LED lamp showing but nothing in the room to indicate why is a common occurrence. In trying to determine the cause, the first avenue of investigation would be to talk to the person(s) who were occupying the space at the time of the actuation. If this does not get a result check the following:
- Open windows, ionisation type detectors in particular are susceptible to draughts.
 - Ventilation outlets near to the detector; stains on the ceiling may indicate dust blown towards the detector.
 - Machinery, boilers and other equipment in the area that may have switched on around the time the detector activated.
 - Detector sited too close to doors causing air movement around the detector.
 - High amounts of dust due to poor housekeeping.
 - Water ingress especially in humid atmospheres.
 - Electromagnetic interference from high voltage plant.
 - Smoking.
 - External fumes from vehicles and burning garden refuse.
 - Adverse weather.



- 1.6.2 The above list is not exhaustive; there are far too many reasons why a false alarm is generated to be listed here. Where a cause is difficult to identify, a good place to look is the false alarm record as this may record previous activations of the same detector, and the causes.

Owner/occupier role and responsibilities

Owners/occupiers are responsible for ensuring the reliability of their fire alarm systems and minimising the possibility of false alarms occurring. They should therefore make arrangements for their fire alarm system to be taken 'off line' when the premises are occupied and a responsible person can make a 999 call in an emergency.

The fire alarm system should be taken 'off line' when the premises are occupied and control measures put in place in the following circumstances:

- Before any fire alarm test is carried out e.g. routine weekly test.
- Before any work is carried out on a fire alarm system by a fire alarm engineer, who should be competent and preferably third party accredited.
- Before workmen are permitted to carry out any work in the vicinity which could activate the fire alarm system, e.g. hot work, creation of sparks, dust, fumes, electrical disturbances etc. The protection of optical smoke detectors to prevent ingress of dust is recommended to avoid subsequent false alarms.
- If a UFS has been produced, e.g. due to a fire alarm system fault, and the cause has not been satisfactorily cleared or the necessary work to rectify the fault has not yet been carried out by the alarm maintainer.
- When adverse weather conditions locally prevail, e.g. electrical storms.

Note: In an emergency, if the fire alarm system is 'off line', or if in any doubt, the use of 999 should be made to summon the fire service directly. Additionally, when the fire alarm system is normally 'on line' and has been activated in a real emergency, a 999 call is recommended to back up the fire alarm signal in this situation.

