WHTM 05-03

Welsh Health Technical Memorandum

Firecode – Fire safety in the NHS

Part H: Reducing false alarms in healthcare premises

GIG CYMRU NHS WALES
Partneriaeth Cydwasanaethau
Gwasanaethau Ystadau Arbenigol
Shared Services Partnership
Specialist Estates Services

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Overview

This Welsh Health Technical Memorandum (WHTM) sets out recommendations and guidance for the reduction of false alarms (see paragraph 1.7) generated by automatic fire detection and alarm systems within healthcare premises.

It is intended for use throughout healthcare premises, including the acute and primary care sectors.

As part of the fire safety management of healthcare premises, the number of false alarms should be minimised. Instances of false alarms impact upon the treatment and care of patients and can result in the loss of appointments, disruption to care and treatment regimes, and can significantly affect staff morale.

This document has been updated from previous revisions to reflect more recent statistics, reporting arrangements and the Welsh Fire and Rescue Services Automatic Fire Alarm Protocol.

This document supersedes Firecode HTM05-03 Part H (Welsh Edition) 2010.

Contents

Chapter 1 Introduction and scope

General application

1.1 This Welsh Health Technical Memorandum (WHTM) provides guidance in respect of the measures necessary to identify, control and reduce false alarms in healthcare premises. The guidance is intended to reduce the burden placed on NHS organisations and fire and rescue services by avoidable, unnecessary fire calls (false alarms and unwanted fire signals). It is intended for use throughout healthcare premises, including the acute and primary care sectors.

1.2 As part of the fire safety management of healthcare premises, the number of false alarms should be minimised. Instances of false alarms impact upon the treatment and care of patients and can result in the loss of appointments, disruption to care and treatment regimes, and can significantly affect staff morale.

1.3 This WHTM includes guidance on the causes of false alarms and practical guidance for reducing their occurrence. In addition, guidance is included in respect of the management of false alarms and reasonable levels of false alarm activation based upon the number of automatic devices included in the system installation.

1.4 The recommendations of this WHTM should be read in conjunction with HTM 05-03 Part B – 'Fire detection and alarm systems' and BS 5839-1.

1.5 The recommendations cannot take account of all situations. It is therefore incumbent upon the organisation's management to ensure that full consideration has been given to any problem and its resolution.

Definitions

1.6 In order to identify incidents of false alarms correctly, it is necessary to define the sources of fire detection and alarm system activation.

1.7 The causes of fire detection and alarm system activation can be broadly classed as one of three incident types: fire, false alarm or unwanted fire signal. These incidents can be defined as follows:

- **Fire** – a fire can be regarded as an incident resulting in the uncontrolled emission of heat and/or smoke.
- **False alarm** – activation of the fire detection and alarm system resulting from a cause other than fire.
- **Unwanted fire signal (UwFS)** – a false alarm becomes an unwanted fire signal at the point the fire and rescue service is requested to attend.

1.8 The 'incident classification decision tree' in Figure 1 *(see page 6)* may assist in identifying the type of incident that has occurred for recording and reporting purposes.

1.9 False alarms should be categorised in order to identify their causes, record and report their occurrence, and allow appropriate actions to be decided on for their reduction (See Appendix A, 'Categories of false alarm').

1.10 Following any false alarm, a thorough investigation should take place to identify the cause. The 'Categories of false alarm' should be used to ascertain the class of cause of the incident. These categories should be used in all recording and reporting of false alarms.

Reasonable level of false alarms

1.11 The occurrence of a false alarm is detrimental to the operation of any healthcare facility. Such instances lead to disruption of service and impact upon patient care, increased costs, and unnecessary risk to those required to respond to the alarm raised.

1.12 While all reasonable means of minimising false alarms should be employed, it is recognised that the complete elimination of false alarms is impossible. It is therefore necessary to determine a reasonable level of false alarms so that an organisation can measure its performance and respond accordingly to its false alarm rate.

1.13 An organisation's false alarm rate will be influenced by a variety of factors, including the building size and the number of detectors/call points associated with a fire detection system, the activities carried out within the building, the building location, and its management.

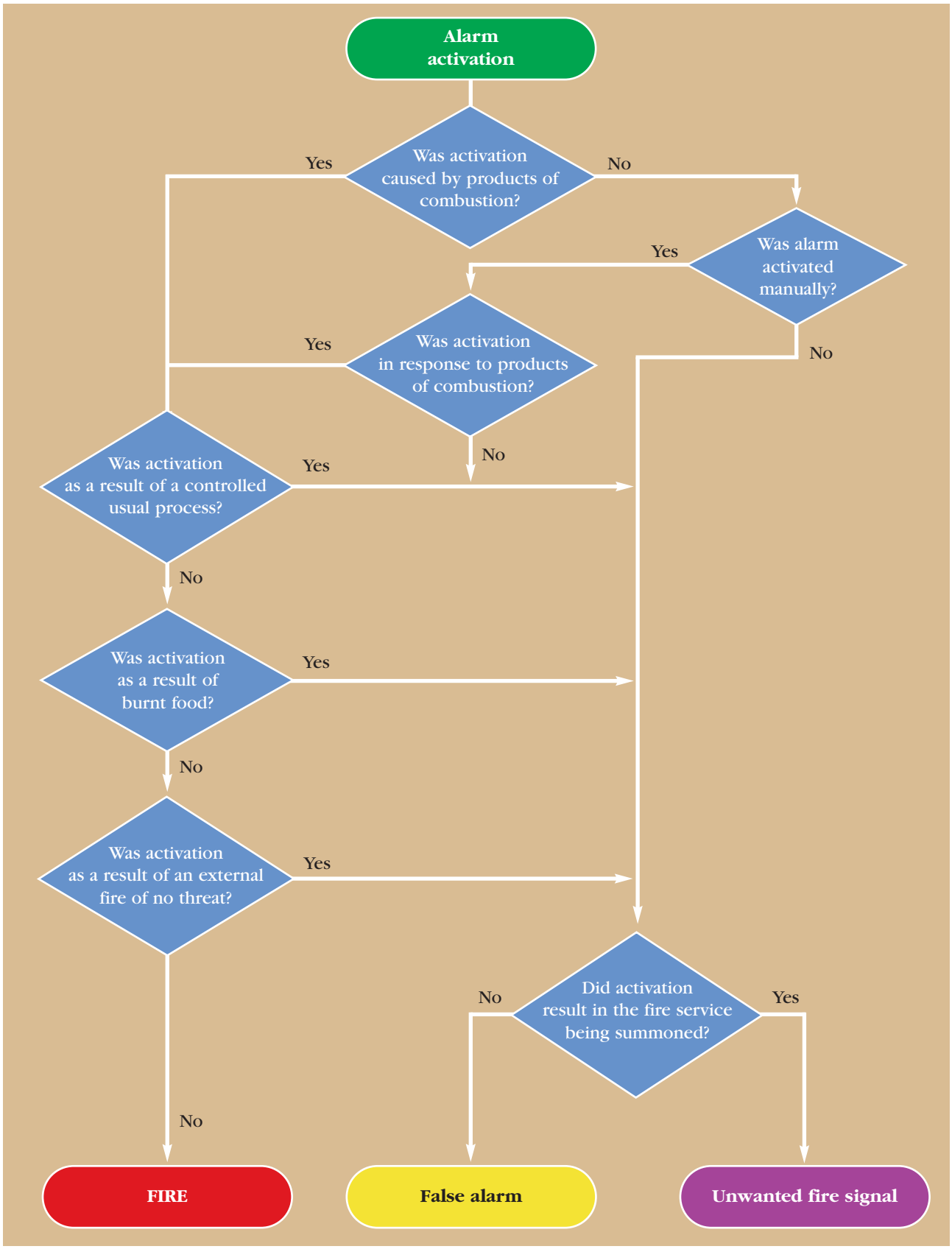


Figure 1 Incident classification decision tree

1.14 The main influence on the rate of false alarms generated by a system is likely to be the number of actuation devices connected to that system. In large complex sites, it is possible that more than one system may be installed and many sites are operated by more than one organisation (management entity). It is therefore appropriate to determine a reasonable ratio of false alarms to the number of actuation devices installed per unit, regardless of the number of systems utilised. For the purposes of this WHTM, a unit refers to a site, or part thereof, controlled by a single management entity.

1.15 A unit's performance in managing false alarms should be calculated and graded in order to ascertain its current performance levels and to determine appropriate goals for annual continuous improvement. The unit's performance should be calculated using the following formula:

$$x = D \div A$$

where:

x = performance;

D = number of automatic detectors and manual call points utilised by the unit;

A = number of false alarms generated by the unit in the last 12 months.

1.16 A unit generating 64 false alarms from a system comprising 2500 automatic detectors and manual call points will achieve a performance of 39.

1.17 A reference chart enabling organisations to assess their grading is provided in Appendix B, 'Performance-level grading chart'. In the above example, the unit's performance would be grade C, and measures should be taken to reduce the incidence of false alarms by at least 40% in the following 12-month period.

Grading	Unit's performance	Annual continuous improvement goal
A	≥100	Performance should be maintained
B	100 > x <50	10% reduction in false alarms
C	<50	40% reduction in false alarms

1.18 The online Fire and UwFS Incident reporting system (see the References section) includes a performance monitoring function, which automatically updates the grading when incidents are reported. For the system to remain effective, NHS organisations should ensure the number of actuation devices at each site is periodically reviewed and maintained up to date in addition to ensuring that all fire alarm activations are recorded.

1.19 All healthcare providers should put measures in place to minimise their false alarms. Each unit should identify their current level of false alarms and set the corresponding continuous improvement goal as a key performance indicator within their management controls.

1.20 Since UwFS involve the summoning of the local fire and rescue service, they impact on the activity and availability of resources to deal with emergencies. For this reason, the fire and rescue services will have an interest in ensuring that the frequency of incidents is minimised and will engage with the responsible persons at sites where false alarms are a frequent occurrence.

1.21 Notwithstanding the above performance targets, NHS organisations should also adhere to the guidance contained in BS5839-1 Section 3 regarding the need to conduct preliminary and in-depth investigations where frequent false alarms occur.

Chapter 2 Management and responsibilities

2.1 All NHS organisations are required to discharge their responsibilities under the Regulatory Reform (Fire Safety) Order 2005 (Fire Safety Order) and to ensure that risks due to fire have been adequately mitigated.

2.2 The issue of false alarms is a subset of fire safety. A detection and alarm system that exhibits a significant level of false alarms will lead to a reduction over time in efficacy of response to an alarm condition.

2.3 Research has shown that many of the causes of false alarms are the result of usual processes not being adequately controlled, for example, cooking fumes or smoke from hot-works activating smoke detection. Failure to adequately control such processes could result in the process becoming the cause of a fire incident. Therefore the process control required to prevent false alarms is also likely to be required to prevent fire.

2.4 A high level of false alarms is symptomatic of failings in adequately managing fire safety issues within an organisation.

2.5 Accordingly, the fire and rescue services could make use of the Fire Safety Order on any occasion that false alarms have a detrimental impact on the fire safety of any relevant person, in order to bring about improvement in fire safety management – including a reduction in false alarms. Such an approach may ultimately lead to enforcement action under the Fire Safety Order.

2.6 Fire safety management needs to reflect the need to minimise false alarms and UwFS.

2.7 Notwithstanding the need to minimise false alarms and UwFS, it is essential that measures put in place to meet this aim do not detract from the level of fire safety afforded to patients.

Roles and responsibilities

2.8 A framework for the management of fire safety is established in HTM 05-01 – 'Managing healthcare fire safety'. This document sets out specific responsibilities in respect of fire safety, including the minimisation of false alarms, for those working in healthcare.

2.9 NHS Organisations should set in place the policies necessary to minimise false alarms.

2.10 All staff within an organisation have a responsibility to minimise false alarms. It is incumbent on all staff to reduce false alarms wherever possible, by controlling their environment, processes and actions to avoid unnecessary activation of the fire detection and alarm system.

2.11 To this end, the fire safety training curriculum that is developed should include instruction in the causes of false alarms, means of minimising their occurrence, and actions to be taken to avoid unnecessary disruption. Further instruction should be provided in incident recording, reporting and remedial action.

2.12 The Fire Safety Manager has responsibility for all aspects of fire safety, including the monitoring and mitigation of false alarms. The Fire Safety Manager should ensure the appointment of a 'Responsible Person' from the premises' management as defined in BS 5839-1. This responsible person is charged with supervising all aspects of the fire detection and alarm system.

2.13 The Fire Safety Manager should co-ordinate sufficient site engineering resources to ensure availability throughout the hours of the unit's operation, with an on-call response at other times.

2.14 The organisation should have in place necessary arrangements to ensure prompt attendance in the event of a fire alarm or reported fault. Following any actuation of the system, information should be recorded in the fire detection and alarm system logbook and via the online Fire and UwFS Incident reporting system (see the References section).

Incident recording and reporting

2.15 All incidents of false alarms should be reported to the Fire Safety Manager as soon as practicable following the incident and, in any case, within 24 hours of the incident's occurring.

2.16 Information recorded and/or displayed by the fire detection and alarm system is vital in positively determining the cause of alarm activation and in

some cases is the only means of establishing the sequence of events. It is important that such information is preserved. Once all relevant information has been recorded, the duty engineer should reset the fire detection and alarm system followed by, where appropriate, consultation with the fire service officer attending the incident. A subsequent incident in the location of the activated detection device might not sound a further alarm until the system is reset. Following activation and prior to the system being reset it is imperative that a constant watch is maintained throughout the area in which a device has activated.

2.17 Wherever possible, agreement should be reached with the fire service officer attending the incident as to the probable cause. The categories shown in Appendix A, 'Categories of false alarm' should be used to identify the cause of the incident. The completed briefing should be submitted to the Fire Safety Manager for recording and further action.

Investigation and review

2.18 The Fire Safety Manager should investigate the circumstances surrounding every false alarm incident in order to positively identify its cause, and to record the cause using the categories shown in Appendix A, 'Categories of false alarm'. Details of false alarms should be presented to the Board on a regular basis.

2.19 All false alarms (including UwFS) should be reported to NHS Wales Shared Services Partnership – Specialist Estates Services via the online Fire and UwFS Incident reporting system (see the References section).

2.20 In order for the organisation to adequately address the issue, accurate records of all false alarms should be maintained. The organisation should set in place a mechanism to review the organisation's false alarm performance, and arrangements to mitigate such incidents.

2.21 In tackling the issue of false alarms it is important to involve the appropriate stakeholders. These may include:

- Fire Safety Manager;
- Fire Safety Advisor (where appointed);
- Staff representative;
- Fire detection and alarm system maintainer;
- Fire detection and alarm system manufacturer;
- Local fire service representative;
- Estates Manager;
- Staff residences representative;
- Planning Department officer;
- Contractors (as appropriate).

2.22 This list is not exhaustive; other stakeholders may be required depending on the nature of false alarms experienced and their causes. For example, it may be necessary to include the local authority pest control officer if a number of false alarms are attributable to insect infestations. It is not expected that all stakeholders will attend every meeting, as the attendance at each meeting should be tailored to the main reported causes of false alarms in the organisation.

2.23 Many fire and rescue services have personnel dedicated to the reduction of false alarms and UwFS. Close liaison with the fire service regarding false alarm performance and determining the appropriate measures to be taken to reduce their levels is essential to fostering joint understanding and avoiding undue burden to either party.

2.24 The purpose of this liaison with the fire and rescue service is to review the organisation's performance, the main causes of false alarms and UwFS in that organisation, and the steps necessary to reduce their occurrence.

2.25 The organisation should devise a strategy to reduce the number and frequency of false alarms and UwFS generated by the organisation. The strategy should be submitted to the Board for prioritisation against other risks. Full consideration should be given to the means of false alarm reduction described in Chapter 4, 'Limiting false alarms'.

2.26 Once a strategy has been agreed, the group should meet to monitor progress and review the false alarm performance improvements achieved.

2.27 Details of false alarm performance and of any improvements made should be included in the annual fire safety report to the Board.

Chapter 3 Causes of false alarms

3.1 This chapter provides an analysis of the data reported by the NHS in Wales using the Fire and UwFS incident reporting system between 1 January 2010 and 31 December 2014, during which time a total of 7486 false alarms were reported. While the data presents an all-Wales perspective, it is recommended that it is analysed in a similar format for each organisation to allow specific false alarm and UwFS reduction measures to be developed.

Analysis of data

3.2 A breakdown of the reported false alarm causes in healthcare is given in Figure 2. This shows that the largest cause of unwanted activation of fire detection and alarm systems is attributed to 'Other environmental effect' (21%). This category is used to record false alarm incidents involving steam, dust, electrical and other environmental influences.

3.3 The second highest cause of false alarm activation is 'System fault/design' (20%) such as inappropriate detection for the activities undertaken in that area. It is evident in some cases that, where the cause of the activation cannot be accurately determined, it has been assumed that the system is faulty and the cause consequently reported as a 'system fault/design'. Where the cause cannot be accurately identified, the incident should be recorded as 'unknown'. This will reduce any distortion of the figures associated with system faults.

3.4 'Unknown' accounts for 14% of false alarms reported. It is not possible to directly reduce these incidents without determining their cause. As with system fault, it is important, therefore, to thoroughly investigate all false alarms to accurately determine their cause and identify a potential solution.

3.5 'Cooking' related incidents account for 14% of false alarms representing a significant issue that needs to be addressed.

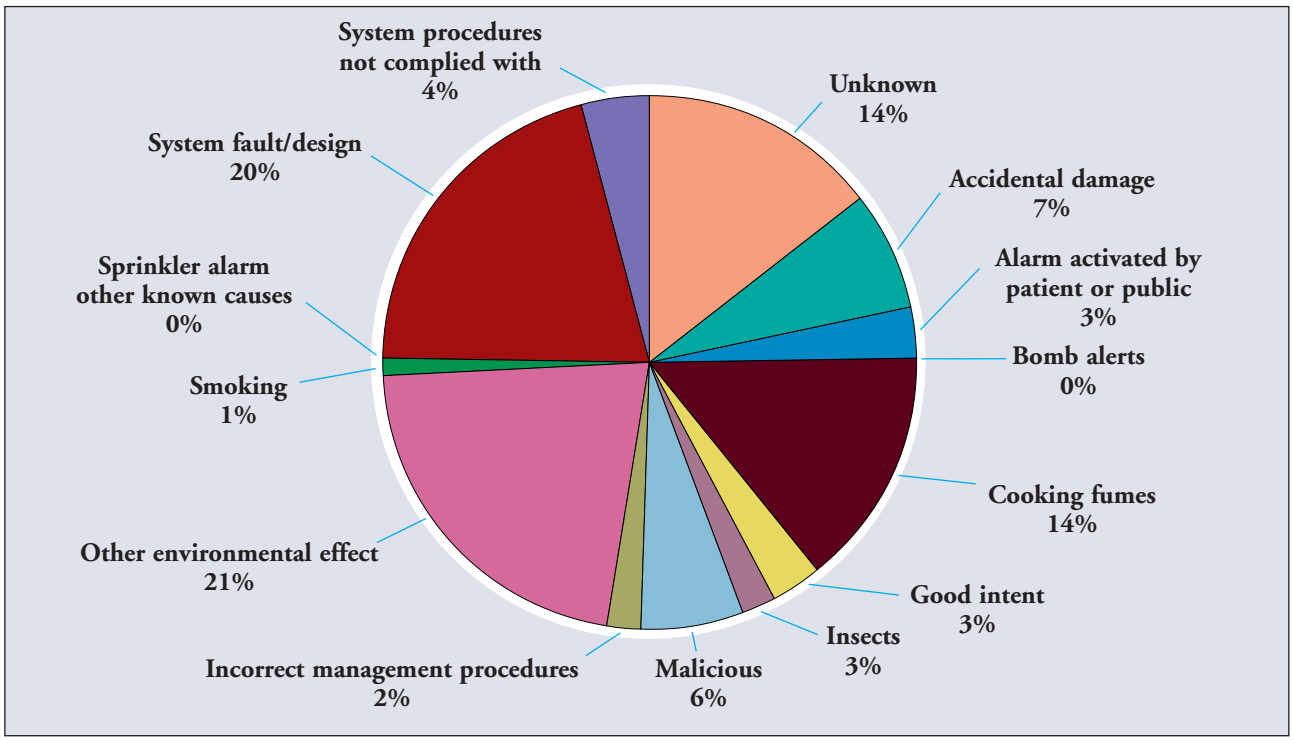


Figure 2 Reported causes of false alarms in healthcare premises (7486 incidents)

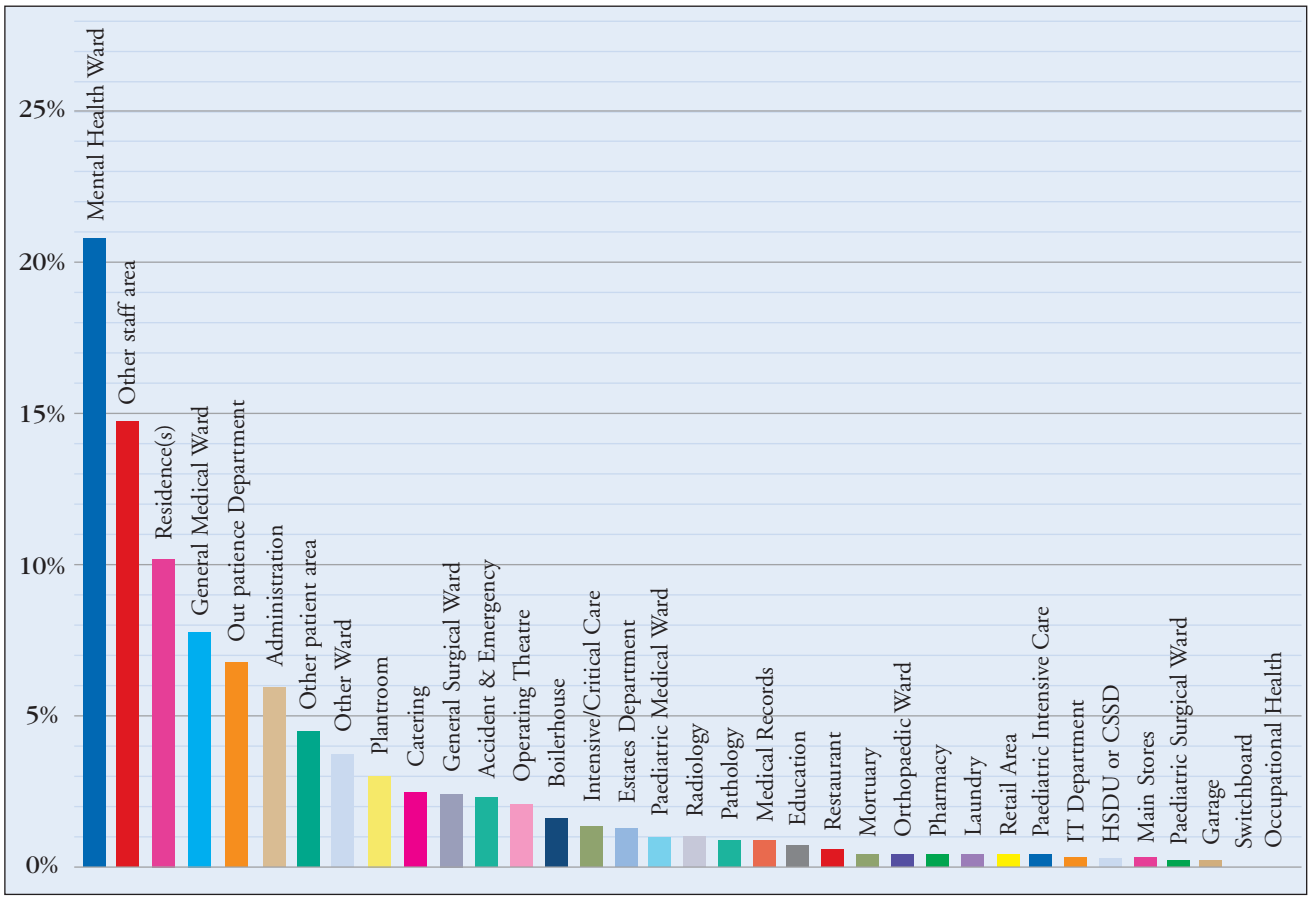


Figure 3 Incidents by area (7486 incidents)

Incidents by area

3.6 Based on the incidents reported, Figure 3 illustrates the most likely location where incidents will occur, with 20.7% of all false alarms originating in mental health wards.

3.7 Any activation of the fire detection and alarm system in a patient area is likely to have a direct impact on patient treatment and care, more so than an incident occurring in a staff area. Accordingly, 'incidents by area' can be further subdivided into 'patient areas' and 'staff areas'; this indicates 4272 and 3214 incidents respectively, the causes of which are illustrated in Figures 4 and 5, *(see page 12)*.

3.8 While incidents originating in staff areas are unlikely to directly impact on the provision of treatment and care, patient care can still be indirectly affected. For example, in some plant areas, activation of the fire detection and alarm system may cause the interruption of fuel supplies used for heating or steam generation. Similarly, disruption to the operation of pathology or medical records may have a significant impact on the delivery of patient services.

3.9 Furthermore, it is often the case that an alarm activation from a staff area invokes the same level of response from fire response teams and external agencies as that for areas where patients are accommodated. This occurs since these areas are often connected to the main site fire detection and alarm system, with no provision for discriminating between patient and non-patient areas and communicating this distinction to the attending fire service.

3.10 In comparing incidents in patient and staff areas, it is evident that there are similarities in the proportion of 'system fault/design' and 'other environmental effect' incidents.

3.11 However, there is a significant difference in the number of incidents attributed to 'cooking' and 'malicious' reported in these areas. The higher incidence of cooking in staff areas is primarily due to poor management of cooking practices within staff residences. 'Malicious' incidents, however, are far less likely to occur in staff areas, which is perceived to be due to greater managerial controls and restricted access.

3.12 Whilst the number of smoking related incidents is relatively low, as a source of ignition, smoking present particular concerns, especially in patient areas. Since the introduction of the Smoke-free Premises etc. (Wales) Regulations 2007, with the exception of some mental health facilities, smoking is prohibited in enclosed spaces. Many NHS Organisations have also extended the smoking prohibition to apply across the whole estate including a ban on smoking anywhere within the site boundaries. Therefore, the smoking activity identified is likely to be illicit and in areas

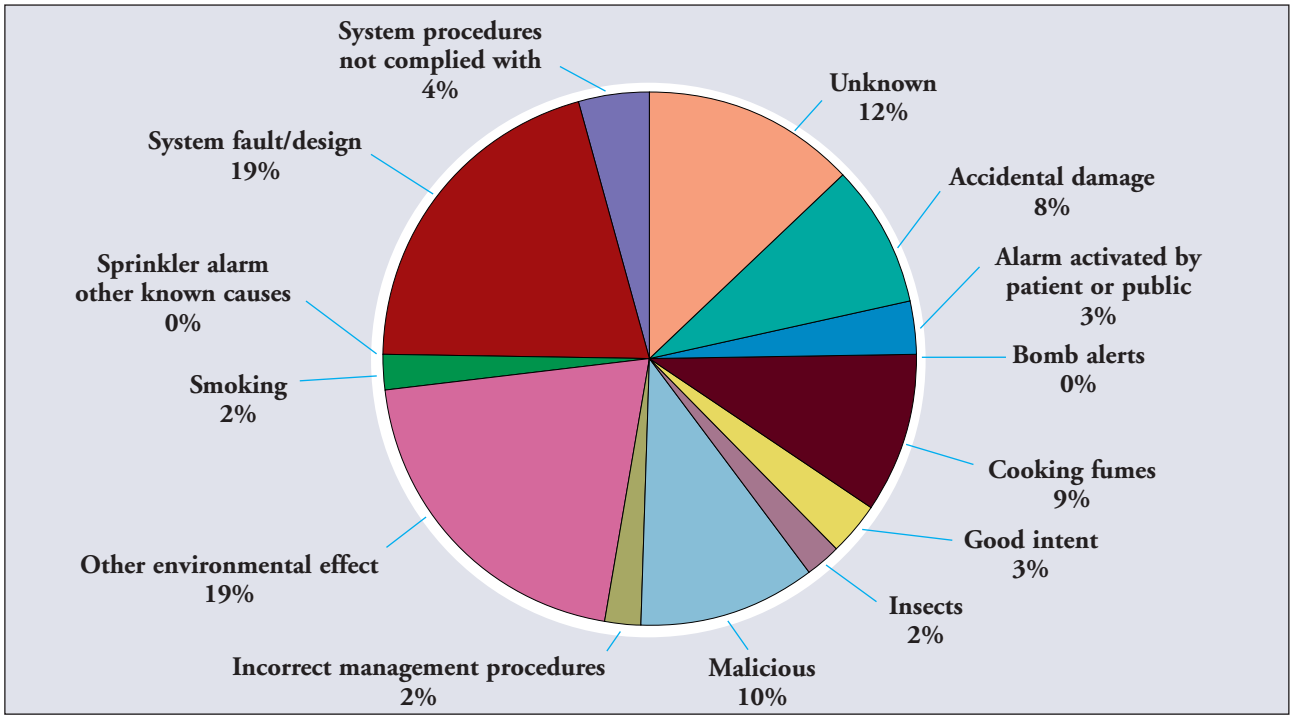


Figure 4 Cause of false alarms in patient areas (4272 incidents)

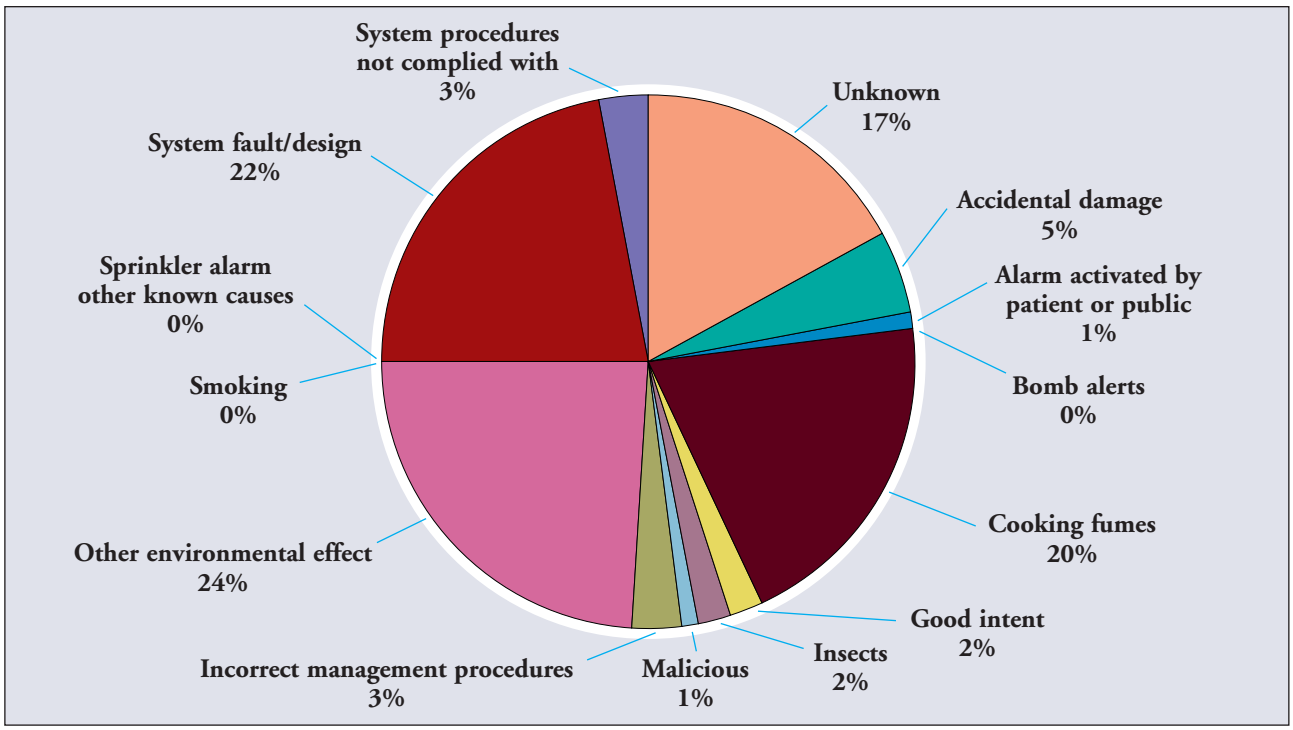


Figure 5 Cause of false alarms in staff areas (3214 incidents)

not under frequent observation; such incidents have the potential to pose a significant fire risk, since carelessly or hastily discarded smoking material may result in a fire. Incidents have also been reported of patients discovered smoking beneath bedding while receiving piped oxygen; such practices present a high risk of fire with serious potential consequences.

Incidents by room

3.13 A further breakdown of the reported causes of false alarms is given in Figure 6, which indicates the types of room in which a false alarm is most likely to occur. This shows that most false alarm activations (37.6%) occur within corridors and circulation spaces. Approximately 37% of these were attributed to the activation of the fire detection and alarm system by means of manual call points, which include:

- incidents of malicious activation (12.4%);
- activation by patients or the public (12%);
- accidental damage (10%);
- alarms of good intent (3%).

3.14 A significant number of false alarms were initiated within corridors and circulation spaces as a result

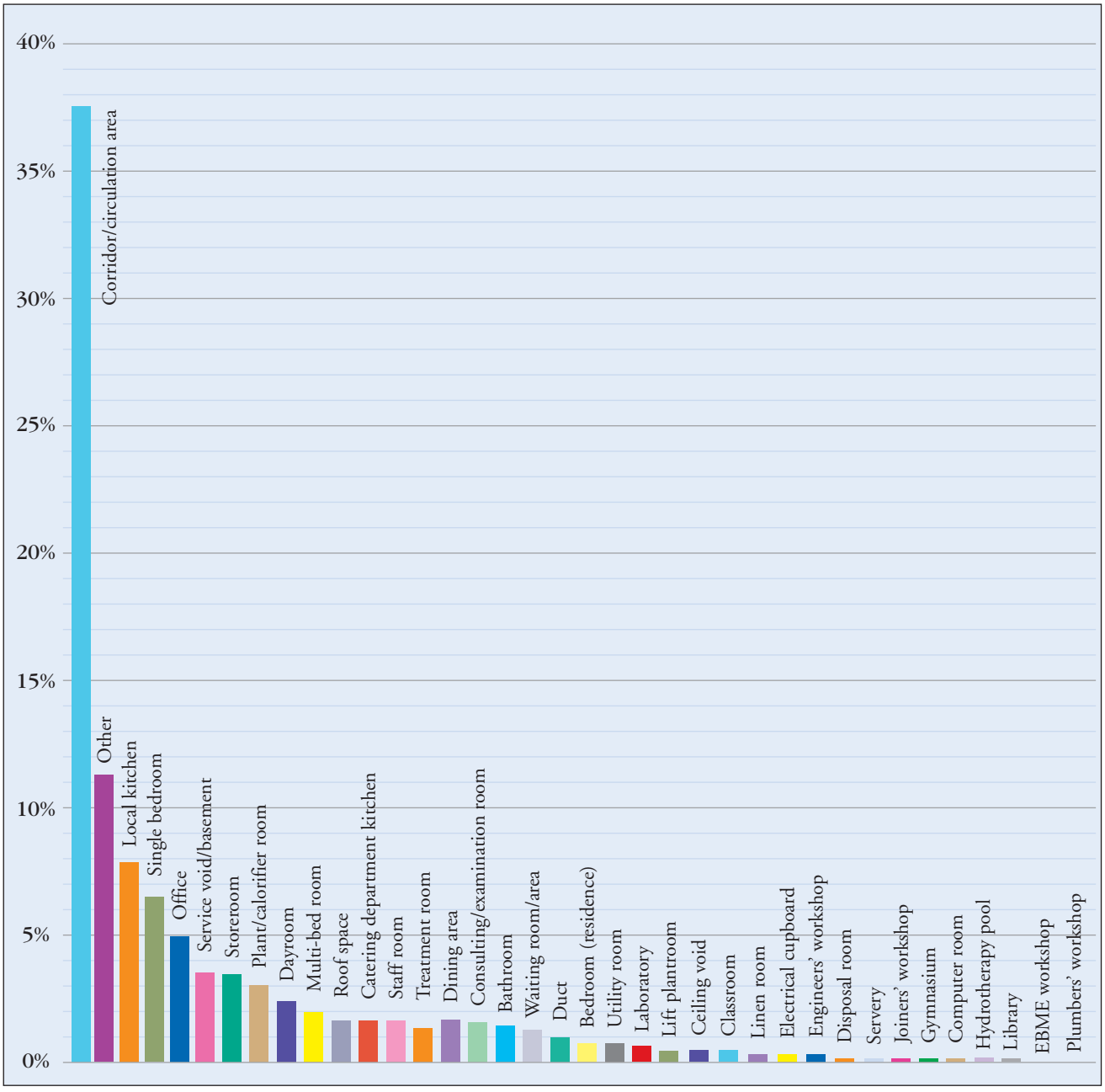


Figure 6 Incidents by room (7486 incidents)

of cooking fumes permeating beyond the kitchen via open door into the corridor (5.8%), highlighting the importance of keeping kitchen doors leading to corridors closed. Where this is unavoidable, smoke detectors should not be sited in the immediate vicinity of the kitchen door.

3.15 Reports of 'other' room locations, accounting for 11.3% of reported incidents do not allow specific analysis, since the exact room type/use is not known.

3.16 Such incidents are thought to have started within rooms not specifically identified in the reporting system.

3.17 A significant number of false alarms are also reported to have started in local kitchens (7.9%). It is thought that most of these false alarms are as a result of inappropriate detection being provided to the kitchen area.

Incidents by time

3.18 Figure 7, clearly illustrates a sharp rise and peak in the number of incidents occurring early to mid-morning, followed by a steady decline through the afternoon and evening, which correlates with the activities of the day. This time profile may be useful in supporting the use of time-related systems for filtering UwFS.

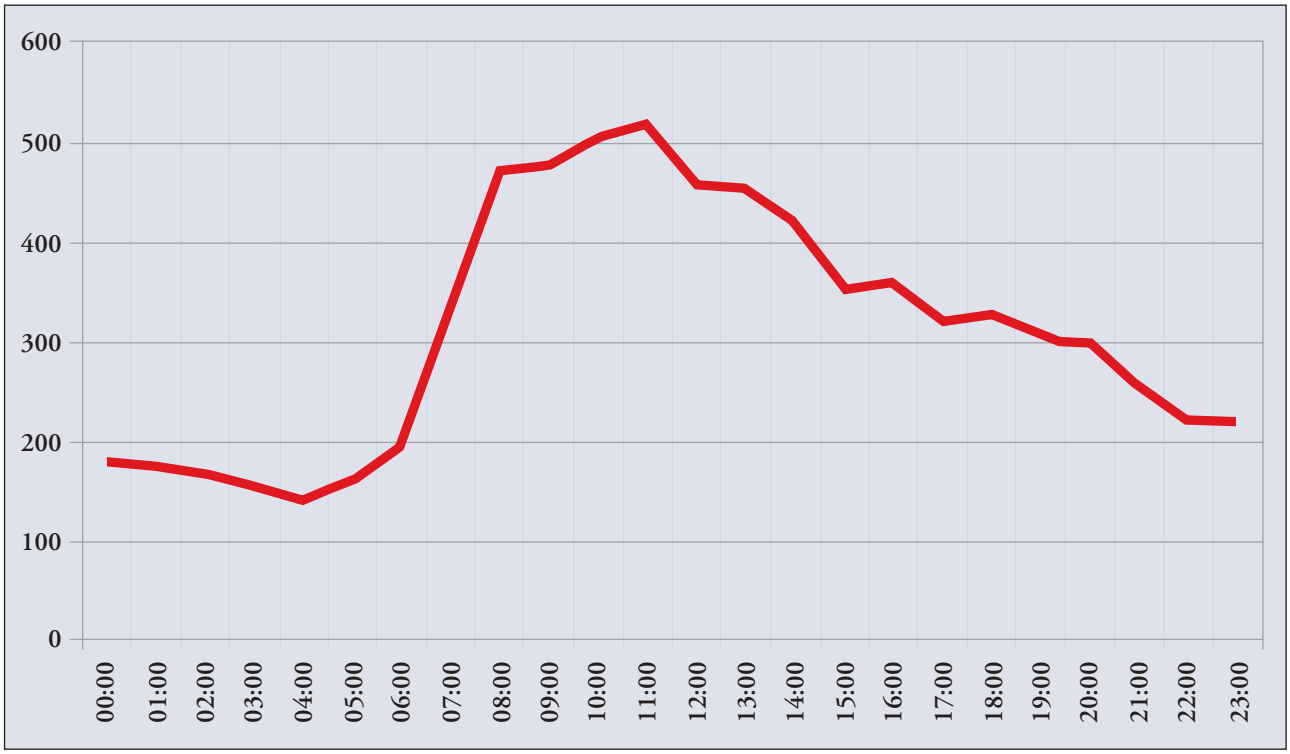


Figure 7 Incidents by time (7486 incidents)

Chapter 4 Limiting false alarms

4.1 The advice provided for limiting false alarms is not exhaustive, nor is it considered appropriate in all cases. Any proposal for reducing false alarms should be considered by the relevant stakeholders, and a risk assessment should be carried out where appropriate prior to the introduction of measures.

System design issues

4.2 All designers should be aware of their responsibilities under the Construction (Design and Management) Regulations 2007 and BS 5839-1.

4.3 From the initial design stages of a project, all efforts should be made to minimise false alarms. This consideration should not be limited to the design of the fire detection and alarm system, but should extend to all design issues that may directly or indirectly contribute to the incidence of false alarms. For example, care should be taken when designing kitchen areas to ensure sufficient extraction of cooking fumes, thus avoiding fumes spilling into adjacent areas and activating nearby automatic detection.

4.4 However, the design of the fire detection and alarm system will provide the greatest influence in minimising false alarms. Fire detection and alarm systems should be designed in accordance with HTM 05-03 Part B and BS 5839-1.

4.5 Particular attention should be paid to the change of use of a room; in all cases involving a change of occupancy and/or activity, the method of fire detection within the room should be reviewed.

Minimising false alarms due to cooking activity

4.6 It is important to ensure that cooking activity is only ever carried out in designated areas in which appropriate automatic detection such as heat detectors, and appropriate ventilation measures, have been installed.

4.7 Detectors installed in areas adjacent to kitchens that may be subjected to cooking fumes from the kitchen should not be of the ionisation chamber type.

4.8 Doors to kitchen areas should not be wedged or otherwise held open, since this may permit cooking fumes to permeate beyond the kitchen and activate nearby automatic smoke detection. In addition, this practice may increase the fire risk to occupants and contravene fire safety legislation.

4.9 In circumstances where it is not desirable or practical to keep kitchen doors closed, alternative measures need to be considered. In residential kitchen areas or ward kitchens, these may include the provision of local mains-powered, self-contained smoke detectors in addition to the main detection system, located either in or immediately outside the kitchen. These self-contained detectors are intended to warn local occupants of the presence of smoke prior to the main fire detection and alarm system being activated. This arrangement should be designed to allow nearby occupants to close kitchen doors and ventilate the kitchen in order to avert a false alarm being generated in the main system. Where such methods are employed it will be necessary to provide staff training to highlight the distinction between the self-contained and main building alarms, and the actions to be taken in the event of either being activated.

4.10 In communal kitchens in staff residences, and similar areas, consideration may be given to devices that automatically turn on a kitchen extractor when any cooking appliances are used. Where such devices are used, the kitchen extractor should continue to run for a pre-set time period after all the cooking appliances have been turned off.

4.11 The proliferation of automatic toasters in ward areas should be controlled. The use of toasters in inappropriate areas, incorrect toaster settings, the failure of automatic toasters to 'pop up', and the lack of cleaning resulting in a build-up of breadcrumbs, cause many false alarms. Organisations should set a policy regarding the type(s) of toaster to be permitted and their use. Toasters should only be used in designated areas with appropriate detection measures.

4.12 To mitigate the occurrence of toaster related incidents, consideration should be given to the following:

- wiring toasters directly to the mains supply via a fused outlet connection to prevent them from being moved to inappropriate locations;
- fitting a non-standard mains plug to the toaster with associated power sockets only in designated areas, to prevent relocation; or
- installing pressure switches to toasters that require the user to apply constant pressure while in use and will turn off if left unattended.

4.13 Consideration should be given to specifying the use of conveyor-type toasters only, since these have been shown to reduce instances of burnt toast and resultant false alarms.

Minimising false alarms due to contractor activity

4.14 All tender and contract documents should identify the extent, nature and location of all automatic detection and manual call points located within the vicinity of the works area and any area that may be indirectly affected by the works.

4.15 The contract documents should make it the responsibility of the contractor to ensure that all their personnel are informed of the presence, nature and location of all relevant automatic detection and manual call points.

4.16 All contract documents should clearly identify the contractor as being responsible for taking all necessary precautions to avoid incidents of false alarm.

4.17 The activities of contractors should always be controlled in accordance with appropriate permit-to-work policies. The area and nature of work should be clearly defined and notified to the responsible person, and the Fire Safety Manager where necessary, to ensure the appropriate isolation of the fire detection and alarm system.

4.18 A detailed schedule of work to be carried out should be prepared and submitted by the contractor prior to the commencement of works. This schedule should detail the precise measures the contractor proposes to reduce potential false alarms as a result of the works.

4.19 Particular attention should be paid to works that involve significant amounts of dust. Although isolation of the detection in the area of works will reduce the potential for false alarms whilst the work is being carried out, dust deposited in the detectors during works may cause false alarms when the detection and alarm system is brought back into service or at some point later. Detectors that may be subjected to dust from contractors' works should be covered and sealed from dust prior to the commencement of works, and a full check should be made on completion of works to ensure that all detectors have been uncovered prior to reinstatement of the detection system. It may be necessary to remove covers from automatic detection at the end of each working period to ensure adequate fire detection outside the contractors' operating hours.

4.20 Contractor activity involving hot-works should be subject to a detailed risk assessment including the likelihood of false alarms. A particular issue has been reported where hot-works involving the welding of pipes and ducts have resulted in the transfer of smoke along the pipe or duct to areas remote from the works.

4.21 Care should be taken to ensure that smoke from hot working is appropriately extracted to avoid false alarms. As extracting smoke from hot working may prevent the products of combustion from an associated fire being discovered quickly, consideration should be given to additional safeguards that may be necessary.

4.22 Management controls should be put in place to review a contractor's performance in terms of false alarm generation. Consideration may be given to introducing penalty clauses into works contracts regarding unnecessary alarm actuations by contractors as a result of their activities. A contractor's record of causing false alarms should be taken into account before placing further work with that contractor.

Minimising false alarms due to electrical influences

4.23 Instances of electrical influences causing false alarms are particularly difficult to identify unless system wiring faults or coincidental effects in other electrical systems are observed.

4.24 System wiring faults giving rise to false alarms are relatively small in number, since modern fire detection and alarm systems should discriminate between faults and fire signals from detection devices. However, some instances do occur, and fire detection and alarm system cabling should be properly installed, protected against mechanical damage where necessary and readily identifiable to minimise damage and inappropriate modification.

4.25 Electrical causes of false alarms are largely due to electromagnetic interference affecting either the

alarm and detection system field wiring or power supplies, or the system devices themselves. Reference should be made to the guidance regarding potential interference in BS 5839-1, HTM 05-03 Part B and HTM 06-01.

4.26 Radio-based detection and alarm systems should be compliant with the Radio Equipment and Telecommunication Terminal Equipment Regulations 2000 (as amended).

4.27 All system cabling should be installed using appropriately-specified cables and installation practices in accordance with BS 5839-1, BS 7671, HTM 05-03 Part B and HTM 06-01. Power supplies should be dedicated to the fire detection and alarm system and provide in accordance with BS 5839-1.

4.28 When designing the fire detection and alarm system, detailed consideration should be given to the potential sources of electromagnetic interference, likely field strengths and frequencies. The system designer should carefully consider the effects of interference on the devices proposed, and should ensure that selected equipment is appropriate for use and will not result in false alarms. The system designer should take due regard of the system manufacturers' instructions and guidance to reduce electromagnetic interference.

Minimising false alarms due to steam

4.29 The majority of steam-related false alarms occur in boilerhouses and plantrooms where steam is generated, used and distributed.

4.30 Steam vents should always vent directly to the outside and in any case should not vent in the direct vicinity of smoke or heat detection.

4.31 Care should be taken to ensure that provisions for steam extraction are made wherever steam is used or produced and there is a possibility of water vapour escape.

4.32 The appropriate detection method should be used, and detectors should be appropriately sited in relation to steam production equipment or equipment which uses steam such as water heaters and autoclaves.

4.33 A number of reported false alarms are attributed to steam from kettles in areas such as offices. It is necessary to ensure that beverage facilities are located away from smoke detection. Where false alarms have occurred, beverage facilities should be relocated in specific areas designed for such purpose and with appropriate detection.

Minimising false alarms due to smoking

4.34 Restriction of smoking by patients, visitors and staff can lead to illicit smoking. Often this occurs in areas where automatic detection is installed, and this leads to false alarms being generated. Where such behaviour occurs, it should be controlled in accordance with local management procedures.

Minimising false alarms due to patients or members of the public

4.35 The instances of patient-activated false alarms occur predominantly in mental health wards. The majority of these are reported to be attempts by patients to gain attention or, where electronic door locks are linked to the alarm system, to abscond.

4.36 The provision of automatic detection should not be reduced in order to minimise false alarms, since such action is likely to detract from the overall level of patient safety – particularly in the case of mental health patients, who may present an increased fire risk through inadvertent or deliberate fire-setting.

4.37 The level of staff supervision in mental health units will minimise instances of patients interfering with the automatic detection.

4.38 Activation of manual call points is more difficult to control, since the movements needed to activate a call point are less visible and hence more difficult for staff to prevent.

4.39 Where activation of call points by patients gives rise to false alarms, consideration should be given to providing measures such as lift flaps that prevent call point activation unless the flap is lifted. Further measures may utilise devices that activate a localised audible warning when a flap is lifted prior to call point activation. If such measures prove insufficient, a risk assessment should be undertaken to determine the impact of changing vulnerable manual call points to key-operated units that can be activated only by staff keyholders.

4.40 In many instances, false alarms have been generated as a result of confusion regarding the release of electronic security devices. Doors secured by electronic locking mechanisms are usually provided with a push-button to permit exit from the department or area and with an emergency override green coloured break-glass unit in accordance with BS 7273-4. Since department exits usually coincide with the fire-alarm zone boundaries, it is established practice to also provide manual call points at these locations.

4.41 The number of such controls in a single location has been reported to have given rise to confusion on the part of those seeking to exit the department or area, and has resulted in the inadvertent activation of the fire alarm manual call point in an attempt to release the electronic locking mechanism.

4.42 Consideration should be given to locating the various controls in such a way as to reduce the potential for inadvertent activation of the manual call point.

4.43 Clearly visible signs should be provided to readily identify the location of push-button controls for everyday use and to clearly distinguish the fire detection and alarm system manual call point.

Minimising unwanted fire signals

4.44 A false alarm becomes a UwFS at the point the fire and rescue service is requested to attend. The Welsh Fire and Rescue Services Automatic Fire Alarm Protocol details the approach to attendance to alarm calls received either through Alarm Receiving Centres or via 999/112 emergency calls.

4.45 For most premises, a 'confirmation of fire' is required before full mobilisation is instigated. However, NHS hospitals and healthcare are classed as 'exempt premises' and accordingly the full predetermined attendance will be mobilised using blue lights and horns immediately upon receiving a call.

4.46 Where a confirmed false alarm is reported by the premises before the fire and rescue services' resources are in attendance, one appliance (normally the nearest) will proceed to check and confirm the cause of the alarm and what further action is required. This will be at normal road speed and all other resources will be stood down.

4.47 To support this approach, NHS organisations should ensure they implement robust procedures to enable a 'stand-down' call to be made as soon as possible upon confirmation of a false alarm.

Delay/call filtering

4.48 Call filtering refers to a process whereby following a fire alarm activation a delay is introduced before alerting the fire and rescue service. This is intended to allow a period of investigation to confirm whether the alarm is a genuine fire incident or a false alarm, thereby potentially minimising the occurrence of UwFS.

4.49 However, any delay in the fire and rescue service attending a fire incident could have serious implications for both the affected premises and for the attending fire and rescue crews who potentially may have to tackle a more severe incident because of delayed intervention.

4.50 In most cases, the filtering of alarm calls is inappropriate considering the potential life-risk and importance to the community associated with healthcare premises. Furthermore, for 'patient' facilities it is considered that there should be no delay in summoning the fire and rescue service in response to the actuation of the fire alarm system. This follows the principles of BS 5839:1 and the recently revised Welsh Fire and Rescue Services Automatic Fire Alarm Protocol.

4.51 It must, however, be recognised that the NHS estate is both vast and varied and some premises may not have patient facilities. Therefore, provided that the non-patient facilities are remote, and a fire there would pose no threat to patient safety, some form of call filtering may be appropriate.

4.52 Where this is the case, it will be necessary to consider the arrangements in place for summoning the fire and rescue service. In locations where a fire alarm signal is relayed to a main switchboard, tasked with dialling 999, call filtering is unlikely to be possible as the operator is unlikely to have sufficient information regarding the cause.

4.53 Likewise call filtering of activations routed through alarm-receiving centres, telecare service providers or fire and rescue service control operators may not be appropriate, since most of the calls raised will again be directed back to NHS switchboard operators who are remote from the incident location and unlikely to be able to provide sufficient detail to confirm the cause of the alarm being raised.

4.54 Any proposed delay must be discussed with the local fire and rescue service. The extent of any delay should be determined following due consideration of operational factors and a detailed fire risk assessment.

4.55 Where a delayed call is utilised, a robust protocol must be established and disseminated to all staff concerned to ensure that the appropriate procedures are followed for each alarm signal generated and that appropriate actions are taken to mitigate risks. For example:

- Alarms within the building where the activation occurs should be sounded immediately.
- Occupants should evacuate the building in accordance with their local fire procedures.
- An appropriately trained the fire response team should be sent to investigate the incident

without compromising their safety. On arrival, attending staff should communicate the status of the incident immediately to the central control point allowing the fire and rescue service to be summoned at the earliest opportunity, or the alarm to be cancelled and a call to the fire and rescue service avoided as appropriate. Where attending staff cannot be certain as to the status of the alarm, a call should be made to the fire and rescue service at the earliest opportunity.

4.56 Such an approach should always be used in conjunction with a 'double-knock/coincidence' system such that the activation of a second detector or manual call point overrides the delay and results in an immediate call to the fire and rescue service. The activation of a manual call point should not initiate a delay, but should result in an immediate call to the fire and rescue service.

4.57 Occupants of residences should be instructed to call the central control point if they are certain that a false alarm has been generated. Nominated staff should still attend to confirm the false alarm incident, and should take on the role of the line manager in gathering information and briefing the Fire Safety Manager.

4.58 In a large number of organisations, tenancy agreements for staff residences include penalty clauses for those tenants that generate false alarms. Such penalties are usually financial penalties and/or ultimately eviction. Whilst these measures have shown some success in reducing false alarms, their use may be counter-productive where a delay to allow investigation is employed. Tenants responsible for generating a false alarm will not be inclined to contact the central control point regarding the incident if they are likely to face a fine or eviction. Hence penalties for generating false alarms should be reduced or in some cases waived where a tenant acts promptly to avoid an unnecessary call to the fire service.

Appendix A: Categories of false alarm

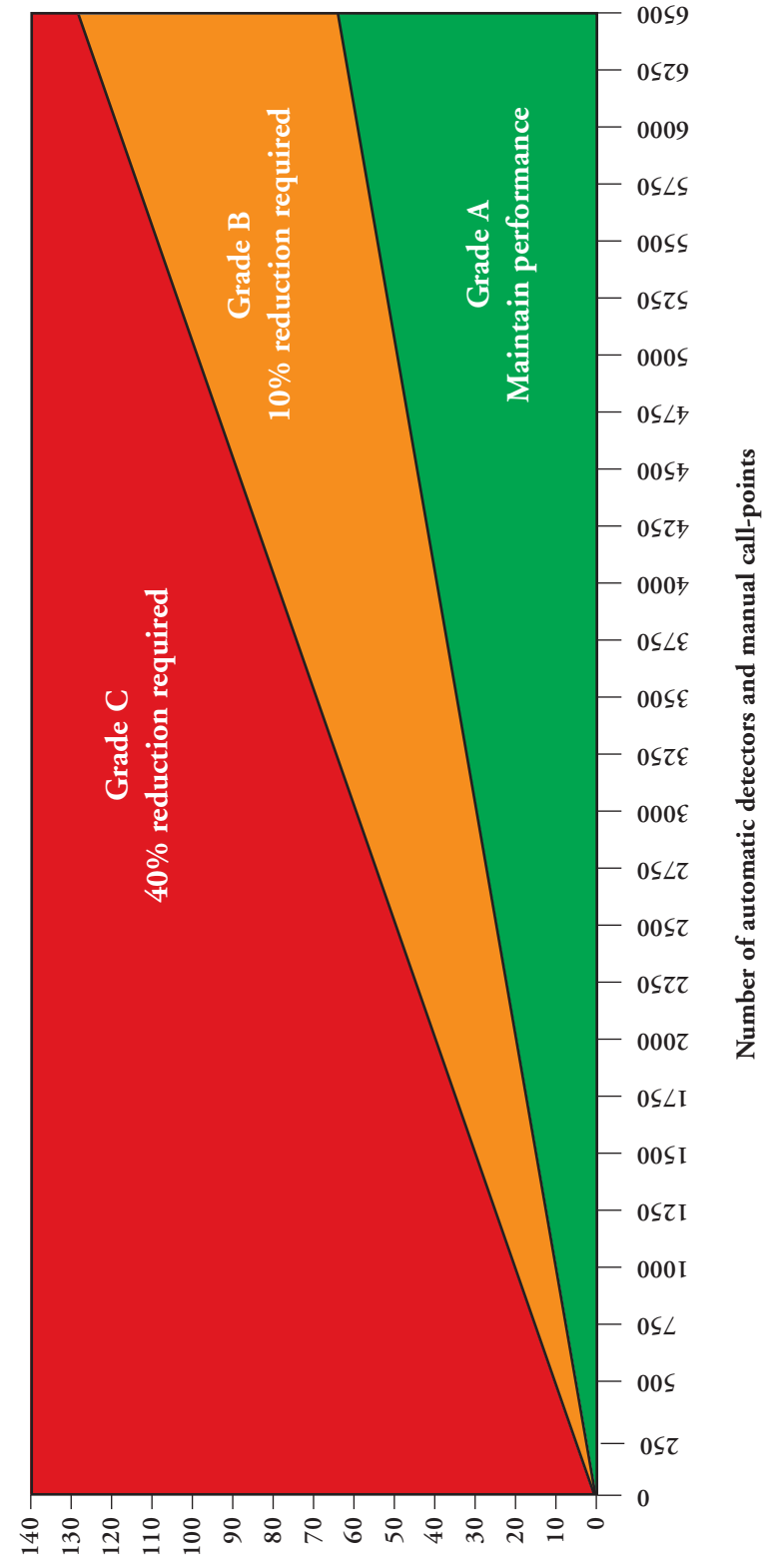
	Class	Task force definition	Examples
1	Malicious	Incident in which the fire alarm system has been activated as the result of the actions of a person who is aware that there is no fire.	Operation of a manual call point or tampering with an automatic detector with the intention of raising a fire alarm signal, knowing that there is no fire.
2	Good intent	Incident in which the fire alarm system has been activated by a person in the belief that there is a fire, when no fire actually exists.	Operation of a manual call point or an evacuation control at the control panel in the erroneous belief that there is a fire.
3	Accidental damage	Incident in which the fire alarm system has been activated as a result of accidental mechanical damage.	Accidental mechanical damage to an automatic detector, manual call point, extinguishing system component, wiring or control equipment; ingress of water to equipment.
4	Alarm activated by patient or public	Incident in which the fire alarm system has been activated as a result of the actions of a person who is not a member of staff when there is no fire.	Fire alarm break glass point or detector activated where the person has not intended to act maliciously.
5	Environmental effect Cooking fumes	Incident in which the system has responded to a fire-like phenomenon or environmental influence. (Other than those in 6 to 8).	Unwanted alarm as a result of detection of cooking.
6	Environmental effect Smoking	Incident in which the system has responded to a fire-like phenomenon or environmental influence. (Other than those in 5, 7 and 8).	Unwanted alarm as a result of detection of smoke from smoking material.
7	Environmental effect Insects	Incident in which the system has responded to a fire-like phenomenon or environmental influence. (Other than those in 5, 6 and 8).	Unwanted alarm as a result of detection of insects.
8	Environmental effect Other	Incident in which the system has responded to a fire-like phenomenon or environmental influence (Other than those in 5 to 7).	Unwanted alarm as a result of detection of environmental influences, other than those included in 5 to 7. This would include a fire outside the building, such as controlled burning which has activated a smoke detector.

	Class	Task force definition	Examples
9	System fault/design	Incident in which the system has produced a fire alarm signal as a result of an identifiable, diagnosed fault.	Circuit fault. Faulty detector. Unsuitable equipment or positioning.
10	System procedures not complied with	Incident which resulted in inappropriate response to incorrect action by a person (Other than malicious action or accidental damage to the system and/or those in 7).	Test of system without prior notification of an alarm-receiving centre. Not closing off detectors when undertaking construction, etc. Not using permit-to-work, eg hot working under detection.
11	Management procedures not complied with/building not used correctly	Incident which resulted in inappropriate response to incorrect action by a person (Other than those in 6).	Incorrect building management, such as, leaving fire doors to kitchens wedged open, actuating adjacent smoke detectors.
12	Bomb alerts	Incident which resulted in inappropriate response to the fire alarm being activated in order to evacuate persons from the premises in the case of or bomb warning or hoax.	Fire alarm activated by building manager following receipt of a bomb alert in order to evacuate the building quickly. The fire alarm should not be used for this purpose. The attendance at the building of the fire service would put fire-fighters unnecessarily at risk.
13	Sprinkler alarm Water pressure	Alarm signal arising from fluctuation of pressure within the sprinkler installation.	Increase in pressure of a town's main, pressure surge on start of sprinkler pumps, or loss of pressure in system.
14	Sprinkler alarm Other known causes	Alarm signal arising from a sprinkler installation for a known reason other than damage or water pressure variation.	There will be very few such incidents.
15	Unknown	Alarm signal arising from a source that cannot be reliably identified.	Unwanted alarm as a result of detection for reasons others than those included.

Note
The 'Unknown' category should only be used for incidents when it is not possible to identify the exact cause of the alarm activation. Further investigation, particularly if repeat activation occurs, should re-categorise the unknown incidents to their true cause.

Table A1 – Specific Causes			
1	Aerosol spray - malicious	15	MCP broken in error
2	Aerosol spray - accidental	16	MCP broken by accidental impact
3	Cooking - burnt toast	17	MCP activated by confused patient
4	Cooking - unattended	18	MCP activated by unknown person
5	Cooking - inappropriate locations	19	MCP activated maliciously
6	Detector faulty/damaged	20	MCP good intent activation
7	Detector contaminated	21	Smoke from candles
8	Detector type inappropriate for location	22	Smoke/fumes from external source
9	Detector activate through water ingress	23	Steam from mechanical plant
10	Dust - contractors work (drilling/grinding etc)	24	Steam from showers/bath
11	Dust/fumes - cleaning processes	25	Alarm not isolated by Estates
12	Detector knocked - cleaning process	26	Contractor testing system
13	Excessive build up of heat	27	Faulty alarm panel
14	Fumes - contractors hot work		

Appendix B: Performance-level grading chart



Appendix C: Location details

Table 1 – Premises types			
List 1 Site		**List 2 Affected parts**	
1	Hospital/Clinic	1	Factory
2	Sheltered housing	2	Office
3	Health/Residential care	3	Shop
4	Hotel/Boarding houses	4	Residential staff
5	Industrial	5	Residential public
6	Commercial	6	Residential patient
7	Recreational	7	Sports
8	Educational	8	Entertainment (incl. liquor, cinema, theatre, etc)
9	Dispersed housing	9	Clinical areas
10	HIMO (houses in multiple occupation)	10	Communal areas
11	Dwelling	11	Storage area
12	Ambulance premises	12	Teaching area
13	Airport	13	Food preparation area
14	Crown Diplomatic Immunity	14	Concealed areas (voids, etc)
15	Defence establishments	15	Other healthcare areas
16	Emergency services		

The categories printed in white text relate to premises not applicable to the NHS estate in Wales

Table 2 – Area types			
Patient-accessed areas		**Non-patient-accessed areas**	
P1	General medical ward	S1	Catering
P2	General surgical ward	S2	Boilerhouse
P3	Mental health ward	S3	Plantroom
P4	Orthopaedic ward	S4	Administration
P5	Paediatric medical ward	S5	Residences
P6	Paediatric surgical ward	S6	Laundry
P7	Paediatric intensive care	S7	Estates department
P8	Intensive/Critical care	S8	Medical records
P9	Out-patient department	S9	Occupational health
P10	Accident & Emergency	S10	Main stores
P11	Other ward	S11	Mortuary
P12	Radiology	S12	Switchboard
P13	Pathology	S13	HSDU (hospital sterilizing and disinfecting unit) or CSSD (central sterile services department)
P14	Pharmacy	S14	IT department
P15	Operating theatre	S15	Education
P16	Retail area	S16	Residential
P17	Restaurant	S17	Garage
P18	Other patient areas	S18	Other staff areas

The categories printed in white text relate to premises not applicable to the NHS estate in Wales

Table 3 – Rooms			
R1	Single bedroom	R20	Utility room
R2	Multi-bed room	R21	Disposal room
R3	Dayroom	R22	Linen room
R4	Bathroom	R23	Staff room
R5	Consulting/Examination room	R24	Classroom
R6	Treatment room	R25	Electrical cupboard
R7	Waiting room/area	R26	Joiners' workshop
R8	Computer room	R27	Plumbers' workshop
R9	Sewing room	R28	Engineers' workshop
R10	Gymnasium	R29	EBME (Electro-biomedical engineering) workshop
R11	Hydrotherapy room	R30	Plant/Calorifier room
R12	Library	R31	Lift plantroom
R13	Corridor/circulation area	R32	Duct
R14	Dining area	R33	Ceiling void
R15	Local kitchen	R34	Roof space
R16	Catering department/kitchen	R35	Service void/Basement
R17	Servery	R36	Laboratory
R18	Offices	R37	Bedroom (Residence)
R19	Storeroom	R38	Other (State)

Appendix D: Incident briefing information

FALSE ALARM / UwFS BRIEFING

WHTM05-03: Part H (2015 Edition)

Time: **Date:**

Location: **Incident duration:**

Department:

Room:

Location of alarm signal: *(Select codes from Appendix C)* Table 1 List 1 ☐ Table 1 List 2 ☐ Table 2 ☐ Table 3 ☐

Cause of alarm signal: *(Select class from Appendix A)* ☐

Specific cause: *(Select class from Appendix A1)* ☐

Fire Service attendance: Yes ☐ No ☐ **Fire response team attendance:** Yes ☐ No ☐

Fire Service classification (If different from above): ☐

Fire Detection System Information:

Panel Indicators:
(Tick all those applicable)

Fire	Fault	Pre-Alarm	Warning	Disabled	Power	Zone (Number)	Other (Specify)
☐	☐	☐	☐	☐	☐	☐	☐

Panel Text Display:
(enter text as displayed on System Panel and append System Printout)

Detector Indication: Is an indicator visible on the initiating detector? Yes ☐ No ☐

Description of event:

Completed by:

Signature: Contact telephone: Position:

Forward promptly to Fire Safety Manager

Appendix E: Fire alarms incident report

Fire/False alarm/UwFS incident report

WHTM05-03: Part H (2015 Edition)

Tick appropriate box ☐ **Fire** ☐ **False Alarm / Unwanted Fire Signal**

1. Hospital / Site
2. Trust / Organisation
3. Age of building
4. Date of incident
5. Time of incident
6. Time of call to Fire Service:
7. Time Fire Service arrived:
8. Duration of incident:
9. Estimated cost of damage/disruption:

10. Location Details: Dept & Room Name:

Location of alarm signal *(Select codes from Appendix C)*

Table 1 List 1 ☐ Table 1 List 2 ☐ Table 2 ☐ Table 3 ☐

11. False Alarm / Unwanted fire signal incident details

Cause of alarm signal *(Select code from Appendix A)* ☐ Specific cause *(Table Appendix A1)* ☐

Fire Service attendance ☐ YES (UwFS) ☐ NO (False Alarm)

Fire response team attendance ☐ YES ☐ NO

Fire service classification (if different from above) ☐

Fire Incident Details Answer questions 12 to 19 by 'ticking' one or more of the options provided

12. Fire discovered by: *(to be completed for fire incident)*

☐ Employee ☐ Visitor/passer-by ☐ Smoke Detector ☐ Other (please specify)
☐ Patient ☐ Sprinkler ☐ Heat Detector

13. Method of extinguishment: *(to be completed for fire incident)*

☐ None ☐ Fire hose ☐ Smothering ☐ CO_2, Inert gas etc
☐ Self extinguished ☐ Dousing with water ☐ Removal ☐ Fire Service
☐ Portable extinguisher ☐ Equipment isolated ☐ Sprinkler ☐ Other (please specify)

14. Material first ignited: *(to be completed for fire incident)*

☐ Raw materials ☐ Bedding, mattress ☐ Fittings ☐ Decoration, soft toys
☐ Vegetation ☐ Upholstery ☐ Food ☐ Cleaning materials
☐ Clothing on person ☐ Other furnishings ☐ Electrical insulation ☐ Waste
☐ Other textiles ☐ Structure ☐ Lagging ☐ Unknown
☐ Other (please specify)

15. Spread of fire within room of origin: *(to be completed for fire incident)*

☐ Not applicable ☐ Stored material ☐ Furnishings - linings ☐ Other (please specify)
☐ Confined to item ☐ Furnishings - fittings ☐ Equipment

16. Cause of fire: *(to be completed for fire incident)*

☐ Deliberate ☐ Water heating ☐ Equipment failure (elec) ☐ Smoking
☐ Cooking appliances ☐ Hot work ☐ Equipment failure (mech) ☐ Unknown
☐ Space heating ☐ Lighting ☐ Wire & cable (fixed) ☐ Other (please specify)
☐ Central heating ☐ Naked lights ☐ Wire & cable (leads)

17. Spread of smoke beyond room of origin: *(to be completed for fire incident)*

☐ Not applicable ☐ Adjacent room(s) ☐ Stairway(s) ☐ Adjacent building(s)
☐ Confined to item ☐ Street/main corridor ☐ Other floor(s) ☐ Other (please specify)
☐ Corridor(s) ☐ Adjacent department(s) ☐ Roof void(s)

18. Spread of burning beyond room of origin: *(to be completed for fire incident)*

☐ Not applicable ☐ Adjacent room(s) ☐ Stairway(s) ☐ Adjacent building(s)
☐ Confined to room ☐ Street/main corridor ☐ Other floor(s) ☐ Other (please specify)
☐ Corridor(s) ☐ Adjacent department(s) ☐ Roof void(s)

19. Route of fire spread: *(to be completed for fire incident)*

☐ Not applicable ☐ Spaces/voids ☐ Open fire doors ☐ External
☐ Ducts ☐ Defective fire stopping ☐ Stairways/lifts ☐ Other (please specify)

Effects on persons involved

20. Extent of evacuation:

☐ Unnecessary	☐ Department	☐ Floor	☐ Adjacent building(s)
☐ Room only	☐ Street/main corridor	☐ Other floor(s)	☐ Other (please specify)
☐ Adjacent room(s)	☐ Adjacent department(s)	☐ Whole building	

21. Fire Response team			
Response team involvement	☐ YES ☐ NO	Number in team:	Duration of involvement:

Answer the following by indicating numbers of persons involved; boxes should be left blank if the answer is 'none'.

22. Number of people in room of origin:	Patients		Staff		Visitors	
23. Number of people evacuated from room:	Patients		Staff		Visitors	
24. Number of people evacuated from department:	Patients		Staff		Visitors	
25. Number of people evacuated from floor/building:	Patients		Staff		Visitors	

26. Injuries to persons	Patients			Staff		Visitors	
	Killed	Injured	Condition aggravated	Killed	Injured	Killed	Injured
Burns							
Smoke inhalation							
Evacuation							

'Near miss' information

The following set of information considers the possible implications had the fire spread further. Answer the following by 'ticking' one or more of the options provided.

27. Area to be next affected: *(to be completed for fire incident)*

☐ Not applicable	☐ Out-patients	☐ Boiler house	☐ Laundry
☐ Mental health ward	☐ A & E	☐ Street/main corridor	☐ Estates department
☐ Elderly ward	☐ X-ray	☐ Lab/pharmacy	☐ Adjacent building
☐ ITU/SCBU	☐ Main kitchen	☐ Admin/offices	☐ Other (please specify)
☐ Other ward	☐ Main plantroom	☐ Main stores	
☐ Operating department	☐ Medical records	☐ Education	

28. Estimate of time that would elapse before the next area was evacuated:

29. Estimate of time evacuation of the next area would take:

30. Additional comments include sequence of events and a brief description of the building construction (where relevant). Provide sketches if necessary and use additional sheets if required.

Return to:

Completed by:

Name: Position:

Signature Date:

References

Acts and Regulations

All the acts and regulations shown below can be accessed from the www.legislation.gov.uk/ website

Regulatory Reform (Fire Safety) Order 2005

Smoke-free Premises etc. (Wales) Regulations 2007

Radio Equipment and Telecommunications Terminal Equipment (Amendment) Regulations 2003. SI 2003 No 1903

Construction (Design and Management) Regulations 2015

British Standards

The latest version of any standard should be used, provided that it continues to address the relevant requirements of these recommendations http://shop.bsigroup.com/en/

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

BS 7273-4 Code of practice for the operation of fire protection measures. Actuation of release mechanisms for doors

BS 7671 Requirements for electrical installations. IET Wiring Regulations. Institution of Engineering and Technology

NHS Wales Shared Services Partnership – Specialist Estates Services

Health Technical Memoranda (HTMs) issued by the Department of Health in England are being superseded by specific Welsh editions which will be titled Welsh Health Technical Memoranda (WHTMs) and which will use the same numerical coding. The guidelines referenced below were the most recent at time of publication, however, the latest version should always be used, provided that it continues to address the relevant requirements of these recommendations and are available from the NHS Wales Shared Services Partnership – Specialist Estates Services websites:

Intranet: http://howis.wales.nhs.uk/sites3/page.cfm?orgid=254&pid= 39106

Internet: http://www.wales.nhs.uk/sites3/page.cfm?orgid=254&pid=6142

Welsh Health Technical Memoranda (WHTM)

HTM 05-01 – Managing healthcare fire safety. Welsh edition

HTM 05-03 Part B – Fire detection and alarm systems

HTM 06-01 – Electrical services supply and distribution

Other

Fire and UwFS Incident reporting system
http://nww.firesystems.wales.nhs.uk/fire/login.cfm

Welsh Fire and Rescue Services Automatic Fire Alarm Protocol.