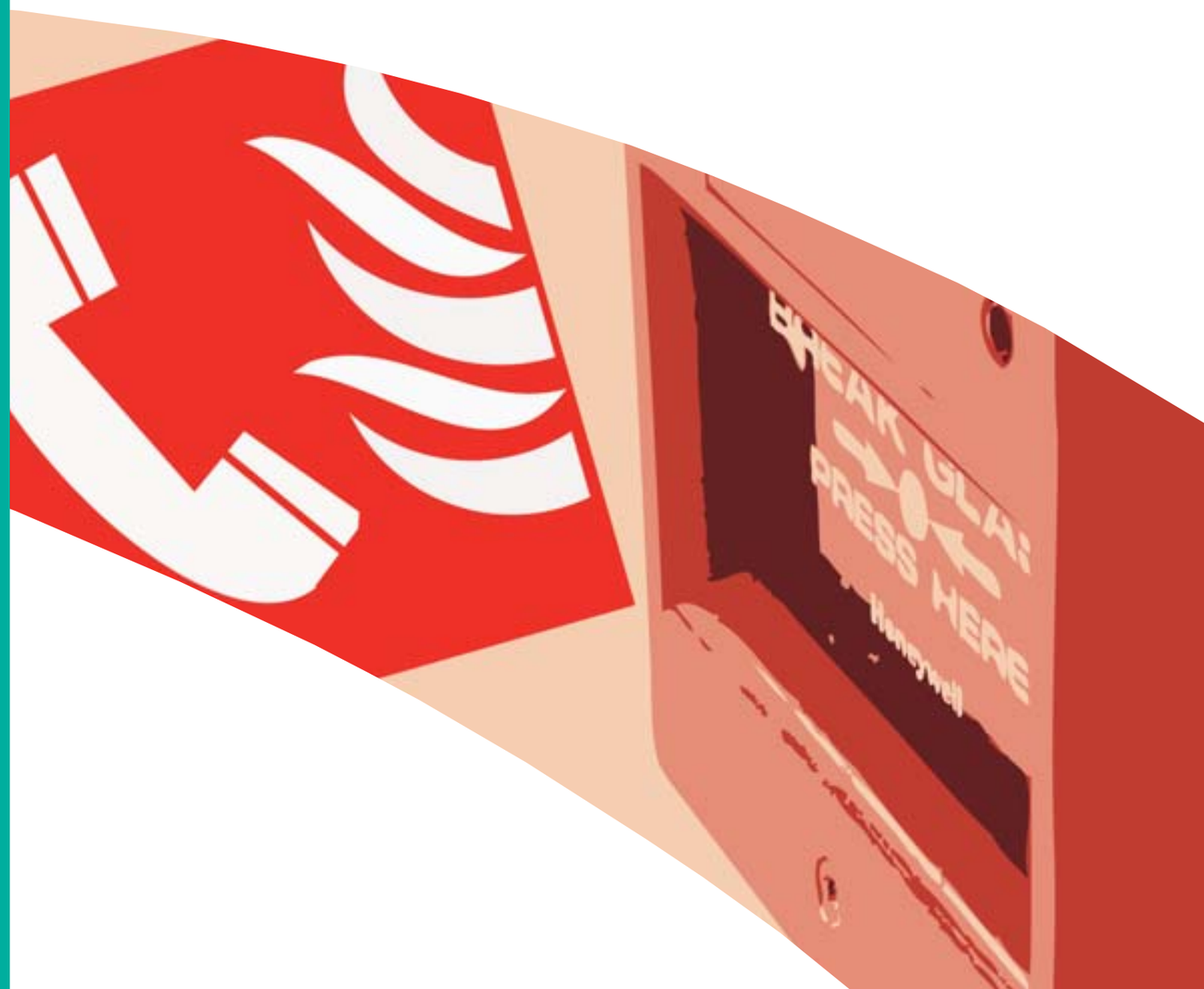
Department of Health

Firecode – fire safety in the NHS
Health Technical Memorandum 05-03: Operational provisions

Part H: Reducing unwanted fire signals in healthcare premises



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Firecode – Fire safety in the NHS
Health Technical Memorandum 05-03: Operational provisions

Part H: Reducing unwanted fire signals in healthcare premises

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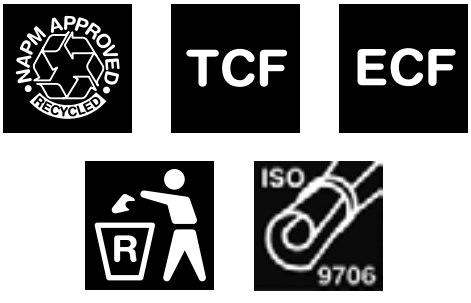


Executive summary

This Health Technical Memorandum sets out recommendations and guidance for the reduction of unwanted fire signals (UwFS; see paragraph 1.6) 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 unwanted fire signals should be minimised. Instances of unwanted fire signals 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 produced as part of the national Government campaign led by HM Fire Service Inspectorate and the Home Office to reduce false alarms generated by automatic fire detection systems.

It has been prepared in consultation with the National Fire Policy Advisory Group, which is chaired by the Department of Health's Estates and Facilities Division and includes representatives from:

- the Department for Communities and Local Government;
- the Chief and Assistant Chief Fire Officers Association;
- the Royal Institute of Chartered Surveyors;
- the Building Research Establishment (BRE);
- the National Association of Hospital Fire Officers;
- the NHS.

Her Majesty's Fire Service Inspectorate will distribute this Health Technical Memorandum to all Chief Fire Officers. It should form the basis of discussions and liaison with local fire services.

Contents

1 Introduction and scope

General application

1.1 This Health Technical Memorandum provides guidance in respect of the measures necessary to identify, control and reduce unwanted fire signals (UwFS) in healthcare premises. The guidance is intended to reduce the burden placed on NHS organisations and fire services by avoidable, unnecessary fire calls.

1.2 This Health Technical Memorandum includes guidance on "acceptable" levels of UwFS, management of UwFS issues, UwFS causes, and practical guidance for limiting UwFS.

1.3 The recommendations of this Health Technical Memorandum should be read in conjunction with Health Technical Memorandum 05-03 'Operational provisions – Part B: Fire detection and alarm systems' and British Standard BS 5839-1.

1.4 The recommendations of this Health Technical Memorandum 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

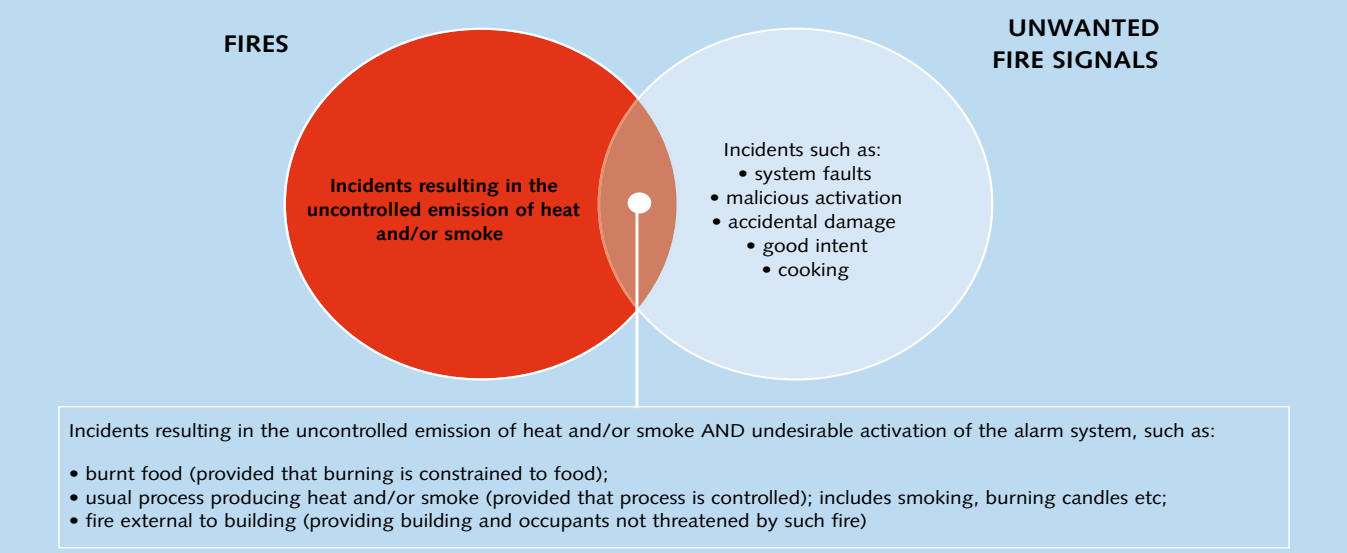
1.5 In order to identify incidents of UwFS correctly it is necessary to define the sources of fire detection and alarm system activation.

1.6 The causes of fire detection and alarm system activation can be broadly classed as one of two incident types: fire; 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;
- **unwanted fire signal** – an incident resulting in the undesirable activation of the fire detection and alarm system.

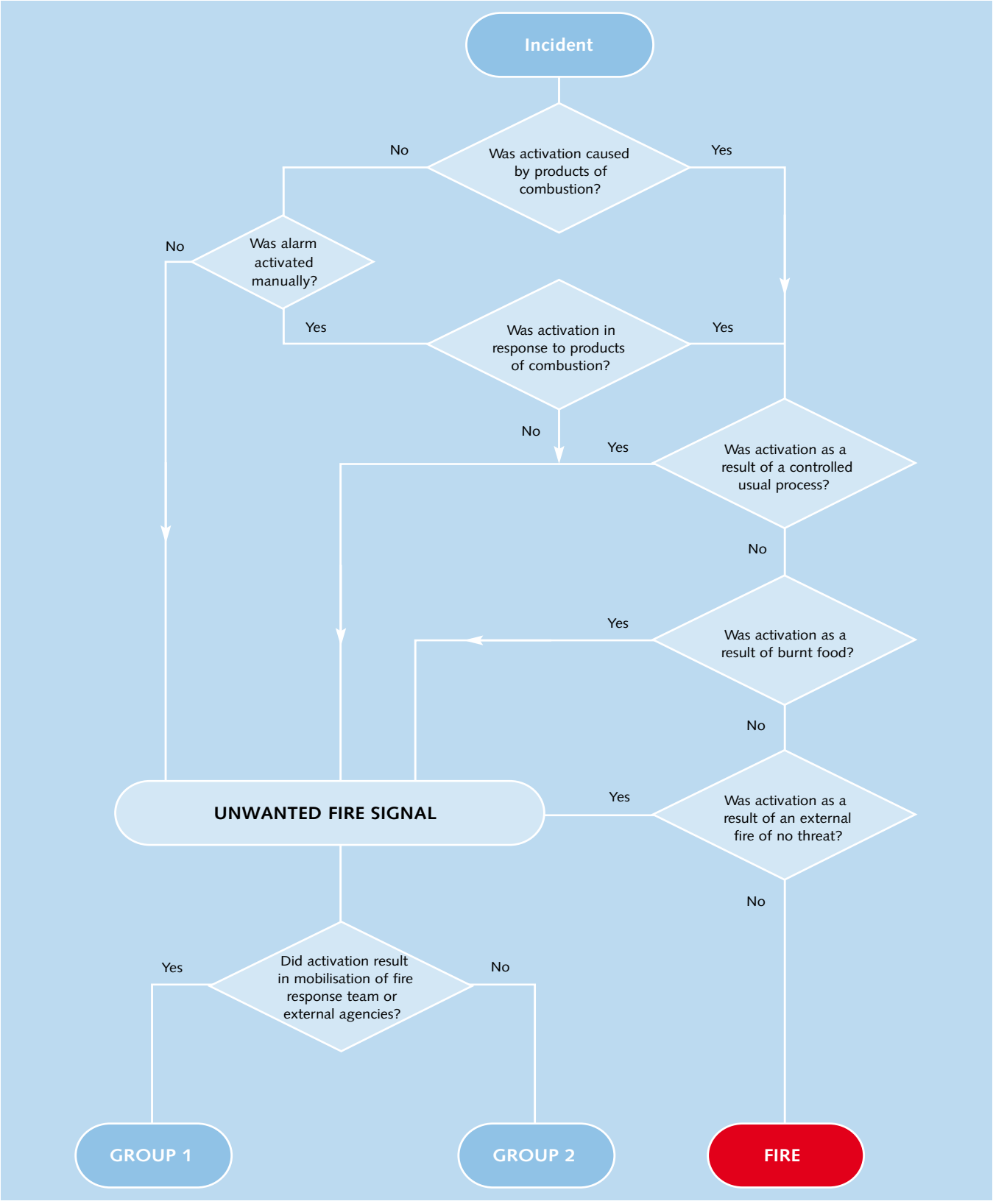
1.7 Since normal activities may result in the uncontrolled emission of heat and/or smoke resulting in an undesirable activation of the fire detection and alarm system, it is possible for a genuine fire incident to be classed as an unwanted fire signal. For example, making toast may result in the uncontrolled emission of smoke due to breadcrumbs in the toaster being heated; where this results in the activation of the fire detection and alarm system, it should be classed as an unwanted fire signal (see Figure 1).

Figure 1 Incident classification



1.8 Determining the classification of incidents is not always clear, as in the case above. The following process diagram (Figure 2) should assist in classifying incident types.

Figure 2 Incident classification decision tree



Categorisation of unwanted fire signals

1.9 Unwanted fire signals 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.

1.10 Following any UwFS an investigation should take place to identify the cause. The table in Appendix A should be used to ascertain the class of cause of the incident. These classes should be used in all UwFS recording and reporting.

Acceptable level of unwanted fire signals

1.11 The occurrence of an unwanted fire signal is detrimental to the operation of any healthcare establishment. Such instances lead to disruption of service and patient care, increased costs, and unnecessary risk to those required to respond to the alarm raised. Therefore, no unwanted fire signal is acceptable.

1.12 However, whilst all reasonable means of minimising UwFS should be employed, it is recognised that the complete elimination of UwFS is impossible. It is therefore necessary to determine an acceptable level of UwFS in order for an organisation to measure its performance and respond accordingly to its UwFS rate.

1.13 An organisation's UwFS rate will be influenced by a variety of factors, including the building size and the number of detectors/call-points, the activities carried out within the building, the building location, and its management.

1.14 The main influence on the rate of UwFS generated by a system is likely to be the number of automatic detectors connected to that system. However, with large, complex sites it is possible that more than one system may be installed. Also, many sites are operated by more than one organisation (management entity). It is therefore reasonable to determine an "acceptable" ratio of UwFS to the number of automatic detectors installed per unit, regardless of the number of systems utilised. For the purposes of this document a unit refers to a site (or part thereof) controlled by a single management entity.

1.15 A unit's performance in managing UwFS should be calculated and graded in order to ascertain its current performance levels and to determine appropriate goals for annual continuous improvement.

1.16 Since those UwFS classified as Group 1 incidents involve the mobilisation of the fire response team and/or external agencies such as the local fire service, their impact on the delivery of service is potentially much greater than that of Group 2 incidents. For this reason, performance measures and improvement goals are specifically aimed at Group 1 incidents.

For units utilising more than 150 automatic detectors

1.17 The unit's performance should be calculated in "detector years" using the following formula:

Performance =

$$\frac{\text{Number of automatic detectors utilised by the unit}}{\text{Number of Group 1 UwFS generated by unit in last 12 months}}$$

A unit generating 64 Group 1 UwFS from a system comprising 2500 automatic detectors will achieve a performance of 39 detector years.

Grading	Unit's performance	Annual continuous improvement goal
A	≥75 detector years	Performance should be maintained
B	≥50 detector years	10% reduction in UwFS
C	≥40 detector years	25% reduction in UwFS
D	<40 detector years	40% reduction in UwFS

1.18 A reference chart enabling organisations to assess their grading is provided in Appendix B.

For units utilising 150 or fewer automatic detectors

1.19 For smaller systems, the expected number of UwFS is comparatively low. Hence, whilst applying the formula above results in an apparent grading, the annual continuous improvement goals result in such small reductions in the numbers of UwFS that measurement of performance improvement is not possible in a reasonable time period.

1.20 Therefore no more than one Group 1 UwFS per year for every 50 automatic detectors, or part thereof, is deemed "acceptable".

1.21 Once this performance level has been attained, performance should be maintained.

1.22 All NHS organisations should put measures in place to minimise their UwFS. Each unit should identify their current level of UwFS and set the corresponding continuous improvement goal as a key performance indicator within Controls Assurance.

2 Management and responsibilities

2.1 All NHS organisations are required to discharge their responsibilities in respect of fire safety and to identify individuals responsible for ensuring that risks due to fire have been adequately mitigated.

2.2 The issue of UwFS is a subset of fire safety. A detection and alarm system that exhibits a significant level of UwFS 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 UwFS 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 UwFS is also likely to be required to prevent fire.

2.4 Fire safety management needs to reflect the need to minimise unwanted fire signals.

2.5 Notwithstanding the need to minimise 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

2.6 A framework for the management of fire safety is established in Health Technical Memorandum 05-01 – 'Managing healthcare fire safety'. This document sets out specific responsibilities in respect of fire safety, including the minimisation of unwanted fire signals, for those working in healthcare.

2.7 With respect to UwFS, the Board should seek to set in place the policies necessary to minimise UwFS.

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

2.9 To this end, the fire safety training curriculum that is developed should include instruction in the causes of UwFS, 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.

2.10 The Fire Safety Manager should take on the role of "Responsible Person" as defined in BS 5839-1. The responsible person is charged with taking responsibility for all aspects of the fire detection and alarm systems.

2.11 The responsible person should co-ordinate sufficient site engineering resource to ensure availability throughout the hours of the unit's operation, with an on-call response at other times.

2.12 The site engineer is to ensure their attendance to the fire detection and alarm system in the event of an alarm or reported fault. The site engineer is to gather all relevant data from the fire detection and alarm system following an alarm or fault condition, and in any case, prior to the system's being reset. This information should be passed to the appropriate unit line manager, and details of the incident should be entered into the fire detection and alarm system logbook.

Incident recording and reporting

2.13 All incidents of UwFS 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.

2.14 It is generally accepted that up to 80% of the details surrounding an incident are lost within 48 hours of it happening. It is therefore important that details surrounding all UwFS incidents are accurately recorded as soon as possible following the incident.

2.15 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 the area in which a device has activated is monitored.

2.16 The local manager should collate all relevant details in the form of briefing as shown in Appendix C. It is important that as much detail is provided as possible, since the details surrounding an incident are vital to determining the correct cause and solution to the UwFS. 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 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

2.17 The Fire Safety Manager should investigate the circumstances surrounding any UwFS incident in order to positively identify its cause, and to record the cause using the categories shown in Appendix A. Details of the incident should be reported to the Board and via the efm-information online reporting system (http://www.efm.ic.nhs.uk).

2.18 As a minimum, the Fire Safety Manager should complete all of the details required for the UwFS incident report form (see Appendix E, which shows the incident form to be completed for the efm-information online reporting system).

Note

There is no mandatory requirement for NHS Foundation Trusts to report fire incidents to the Department of Health.

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

2.20 In tackling the issue of UwFS it is important to involve the appropriate stakeholders. These may include:

- Fire Safety Manager;
- Fire Safety Advisor (where appointed);
- staff representative;
- fire alarm system maintainer;
- fire alarm system manufacturer;
- local fire service;
- Estates Manager;
- staff residences representative;
- Planning Department officer;
- contractors (as appropriate).

This list is not exhaustive; other stakeholders may be required depending on the nature of UwFS and their causes. For example, it may be necessary to include the local authority pest control officer if a number of UwFS 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 UwFS in the organisation.

2.21 In larger organisations it is recommended that a regular meeting be convened with the relevant stakeholders. This meeting should take place at least quarterly, and more frequently for organisations graded "C" or "D".

2.22 The purpose of this meeting is to review the organisation's performance, the main causes of UwFS in that organisation, and the steps necessary to reduce their occurrence.

2.23 The group should devise a strategy to reduce the number and frequency of UwFS in the organisation. The strategy should be submitted to the Board for prioritisation against other risks. Full consideration should be given to the means of UwFS reduction described in Chapter 4.

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

2.25 Details of UwFS performance and of any improvements made should be included in the annual fire safety report to the Board.

3 Causes of unwanted fire signals

Research findings

3.1 A breakdown of reported UwFS causes in acute healthcare is given in Figure 3. This clearly shows that the major cause of unwanted activation of the fire detection and alarm system (43%) is cooking activities. Therefore, if the cooking process is properly controlled, the number of unwanted fire signals should be reduced.

3.2 The activities of contractors working on the estate are reported as the second most common cause of UwFS. This would appear to indicate a need for greater control of contractor activities and work areas.

3.3 Reports of electrical causes of UwFS do not allow specific analysis, since the exact cause is not known. Such incidents may result from cabling faults in the fire detection and alarm system, power supply interference or fluctuations, or electro-magnetic interference.

3.4 A further breakdown of the reported causes of UwFS in acute healthcare is given in Figure 4. This illustrates the main causes, highlighting the hospital areas in which the incident occurred.

3.5 The main reported cause of UwFS, that is, cooking, is predominantly exhibited in residences and ward areas. Whilst the numbers of instances of cooking-related UwFS in wards and residences appear similar, ward areas represent a larger proportion of the hospital area and population than residences.

3.6 The response to an alarm in a ward area is likely to directly involve staff who would otherwise be caring for or treating patients, and therefore represents a significant potential for disruption to patient care.

3.7 The UwFS incidents involving contractor activity are reported across the majority of hospital areas, with no significance to the variation between areas when their relative sizes are considered.

3.8 Similarly, instances of electrical causes of UwFS and those caused by steam are reported across the majority of hospital areas, with variations due mainly to the size of respective areas or the use of the particular services.

Figure 3 Reported causes of UwFS in acute healthcare

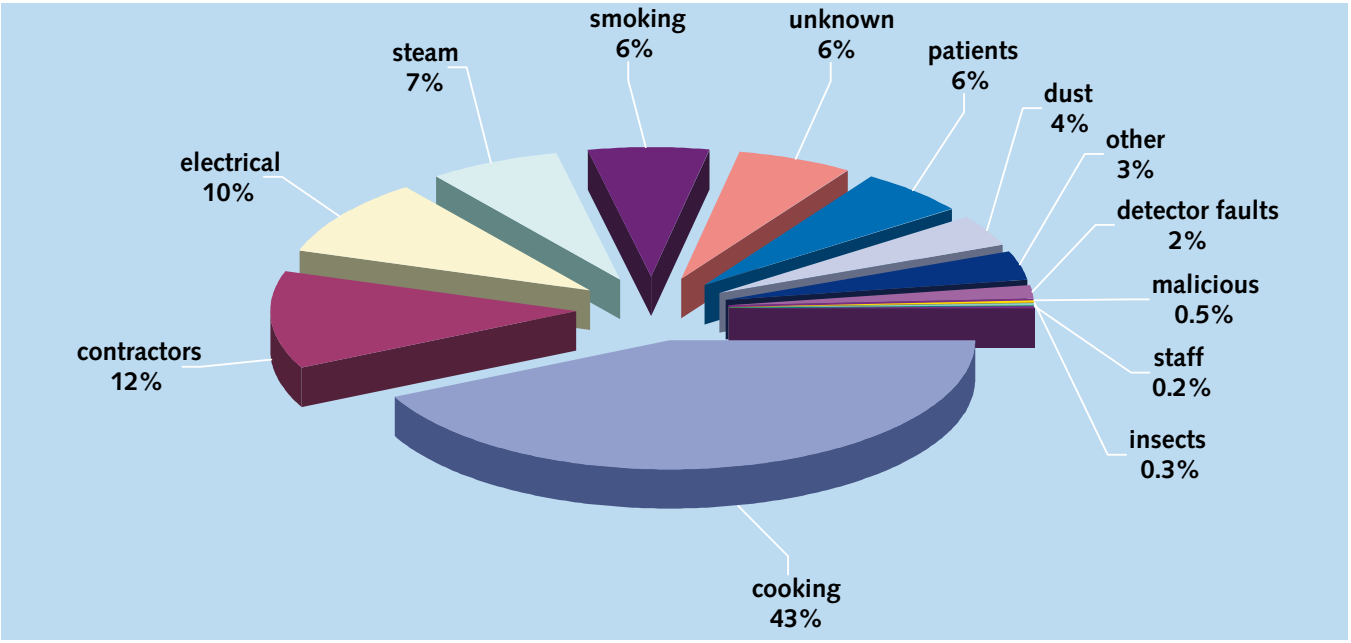
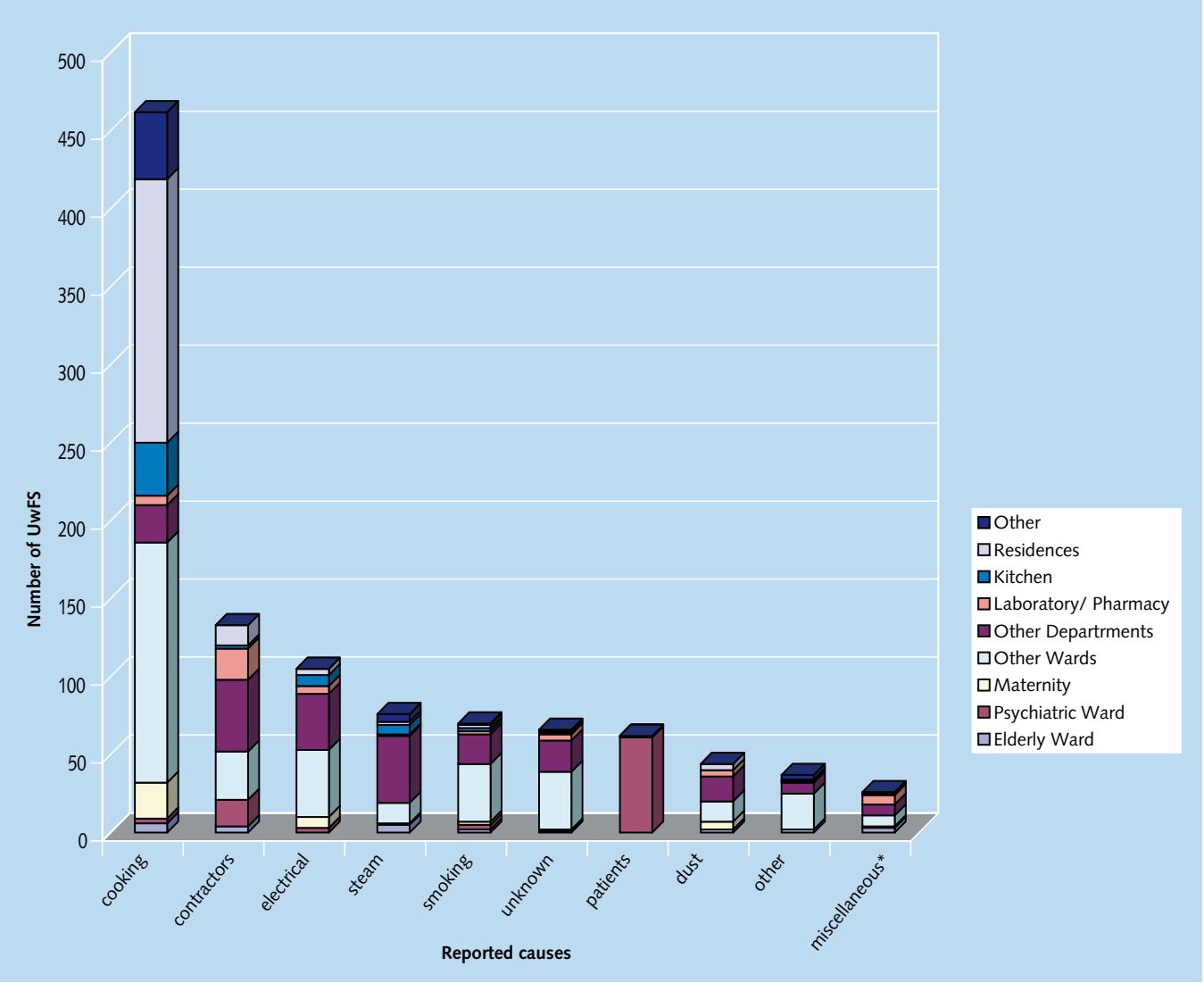


Figure 4 Causes of UwFS and their locations



3.9 Smoking-related UwFS are seen predominantly in ward and other departments (circulation areas). These incidents are of particular importance since many acute hospitals currently operate a blanket "No Smoking" policy. As such smoking activity is likely to be illicit and in areas 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.

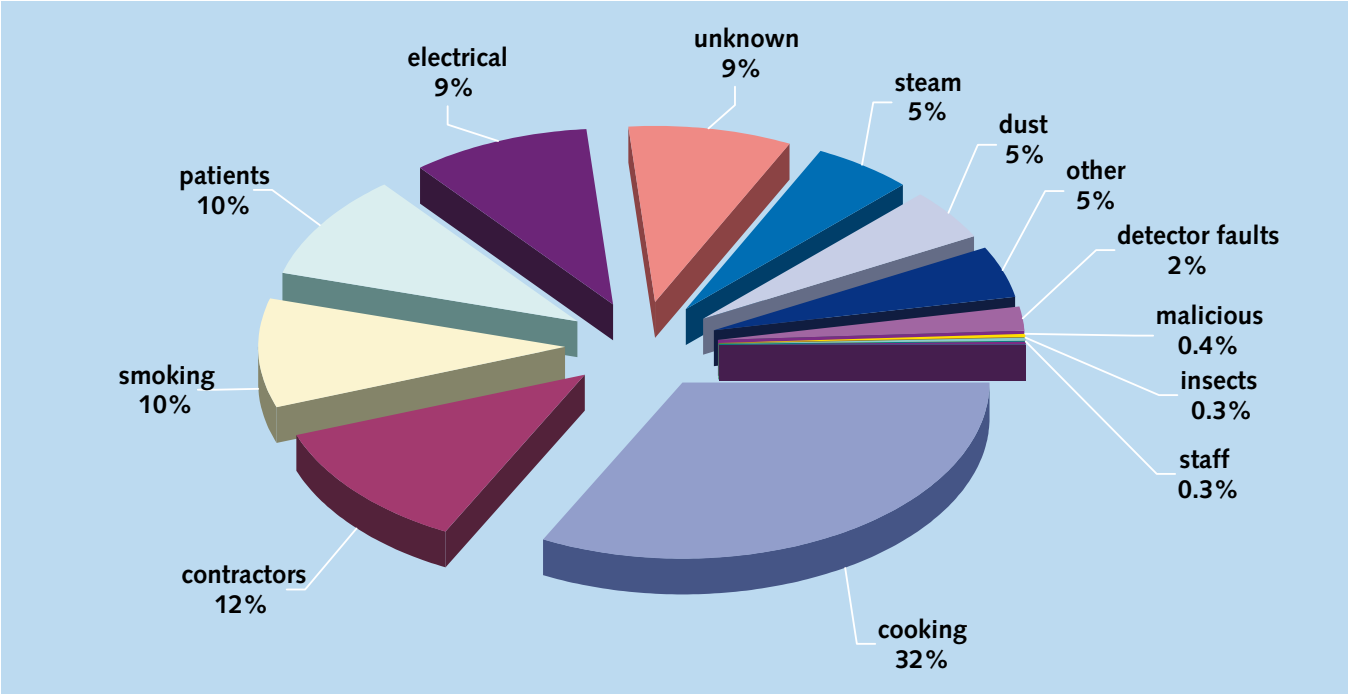
3.10 As a significant number of UwFS are reported as cause unknown, it is not possible to directly reduce these incidents without determining their cause. It is important, therefore, to thoroughly investigate all UwFS to determine their cause and potential solution.

3.11 Incidents involving patients falsely actuating fire alarm systems are reported predominantly in psychiatric wards. It has been reported that psychiatric patients have in some cases deliberately activated manual call points or used cigarette lighters and other smoking material to activate automatic detection. The majority of these instances are not reported as malicious, since it is often the case that the patient is unaware of the full consequences of their actions.

Main causes of UwFS in areas accessed by patients

3.12 A breakdown of the reported main causes of UwFS in areas accessed by patients is given in Figure 5. For the purpose of this document, areas accessed by patients include all ward areas, operating departments, A&E, out-patients, clinics, imaging, and circulation spaces.

Figure 5 Causes of UwFS in areas accessed by patients



3.13 Any activation of the fire detection and alarm system in these areas is likely to directly impact on the provision of treatment and care. Many staff who are directly involved in caring for patients may be required to respond initially to the activation of the alarm system. Such response will be necessary whether the alarm is genuine or not, so the potential for disruption to service is significant.

3.14 In areas accessed by patients the main cause of UwFS has been identified as ad hoc cooking activities. This is predominantly the result of providing patients with toast or other snacks, particularly between the main catering service meal times. 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, have been identified as significant causes of UwFS.

3.15 The second most frequent cause of UwFS in areas accessed by patients is reported to be contractor activity. From the data reported it is not possible to ascertain the proportion of incidents resulting from hot-works or other activity, therefore no comparison between the relatively high number of UwFS caused by contractors and potential fire risks can be made.

3.16 Smoking presents particular issues. Since smoking is usually prohibited or at least tightly restricted, most smoking resulting in UwFS is illicit. It has been reported that patients have been discovered smoking beneath bedding and whilst receiving piped oxygen. Such practices present high risk of fire with serious potential consequences.

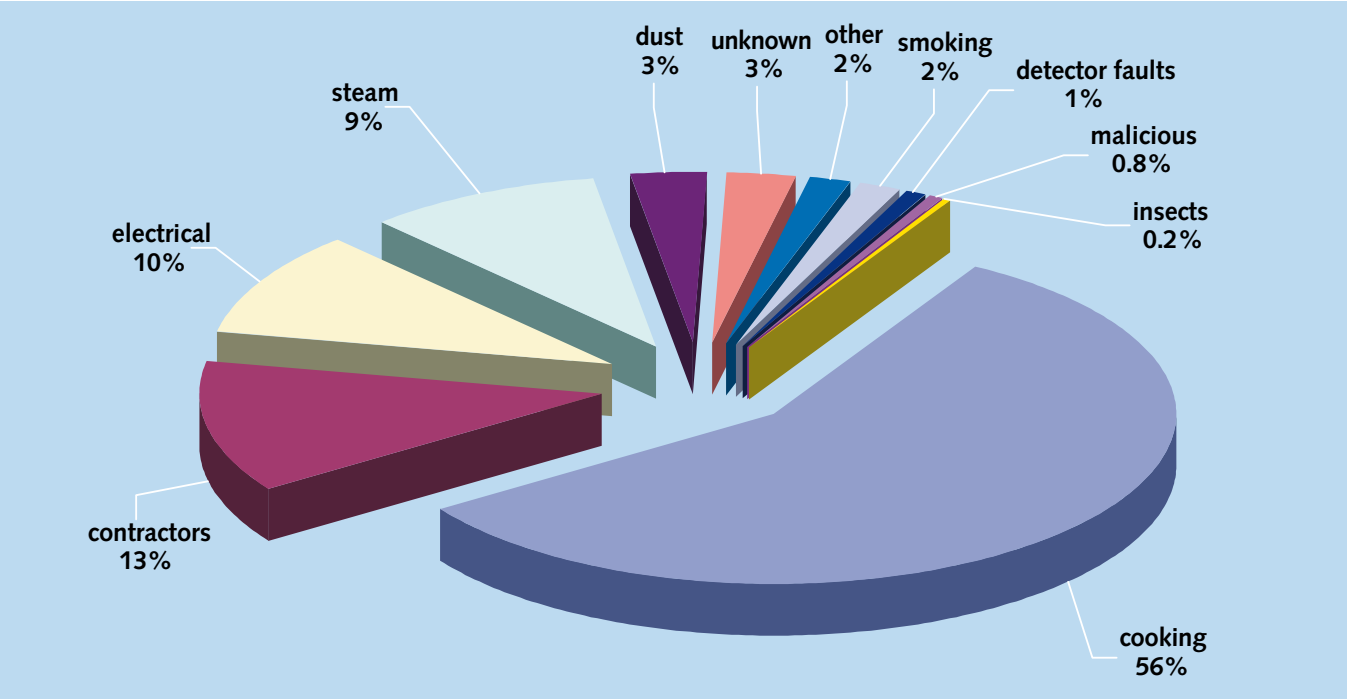
3.17 Incidents of UwFS caused by patients include actuations by psychiatric patients who may be unaware of the full consequences of their actions. Instances have also been reported of UwFS resulting from other patient activity, for example excessive use of aerosol sprays, or deliberate interference with detection equipment.

Main causes of UwFS in areas not accessed by patients

3.18 A breakdown of the reported main causes of UwFS in areas not accessed by patients is given in Figure 6.

3.19 Whilst an activation of the fire detection and alarm system in these areas is not likely to directly impact on the provision of treatment and care, patient care can be indirectly affected. 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. The effects of frequent alarm activation in staff residences can disrupt staff sleeping which, when continued over time, could lead to a loss of staff performance and morale.

Figure 6 Causes of UwFS in areas not accessed by patients



3.20 It is often the case that an alarm activation from these areas invokes the same level of response from external agencies as that for areas where patients are accommodated and which therefore represent a significantly greater life risk. 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.

3.21 The main cause (over 50%) of UwFS in areas not accessed by patients is related to cooking activity. The main source (66%) of UwFS caused by cooking activity is reported to be staff residences, whereas only 13% of cooking-related UwFS are attributed to main kitchens.

3.22 The second most frequent cause of UwFS is the activities of contractors. As with areas accessed by patients, it is not possible to determine the proportion caused as a result of hot-works.

3.23 The relatively large number of UwFS reported due to electrical causes tends to indicate that such incidents may result from the influences of plant and equipment rather than the electrical circuits of the fire detection and alarm system.

3.24 The instances of UwFS caused by escaping steam are relatively frequent, due in part to the generation and use of steam predominantly in areas not accessed by patients. In particular, UwFS caused by steam are most often generated within boilerhouses and plantrooms.

4 Limiting unwanted fire signals

System design issues

4.1 All designers should be aware of their responsibilities under the Construction (Design and Management) Regulations 1994 (as amended).

4.2 From the initial design stages of a project, all efforts should be made to minimise UwFS. 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 UwFS. 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.

4.3 However, the design of the fire detection and alarm system will provide the greatest influence in minimising UwFS. Fire detection and alarm systems should be designed in accordance with Health Technical Memorandum 05-03 'Operational provisions – Part B: Fire detection and alarm systems' and BS 5839-1.

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

Minimising UwFS due to cooking activity

4.5 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.

4.6 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.

4.7 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.

4.8 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 UwFS 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.

4.9 In circumstances such as communal kitchens in staff residences, 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.

4.10 The proliferation of automatic toasters in ward areas should be controlled. 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. Consideration should be given to wiring toasters directly to the mains supply via fused outlet connection to prevent them being moved to inappropriate locations. Alternatively, a non-

standard mains plug should be fitted to the toaster, and associated power sockets should be provided only in designated areas.

4.11 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 UwFS.

Minimising UwFS due to contractor activity

4.12 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 Fire Safety Manager, who will liaise with the responsible person to ensure the appropriate isolation of the fire detection and alarm system.

4.13 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 UwFS as a result of the works.

4.14 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 UwFS whilst the work is being carried out, dust deposited in the detectors during works may cause UwFS 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.

4.15 Contractor activity involving hot-works should be subject to a detailed risk assessment including the likelihood of UwFS. 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.

4.16 Care should be taken to ensure that smoke from hot working is appropriately extracted to avoid UwFS. 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.

4.17 Management controls should be put in place to review a contractor's performance in terms of UwFS 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 UwFS should be taken into account before placing further work with that contractor.

Minimising UwFS due to electrical influences

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

4.19 System wiring faults giving rise to UwFS 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 alarm system cabling should be properly installed and readily identifiable to minimise damage and inappropriate modification.

4.20 Electrical causes of UwFS are largely due to electro-magnetic 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, Health Technical Memorandum 05-03 'Operational provisions – Part B: Fire detection and alarm systems' and Health Technical Memorandum 06-01 'Electrical services supply and distribution'.

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

4.22 All system cabling should be installed using appropriately-specified cables and installation practices in accordance with BS 5839-1, BS 7671, Health Technical Memorandum 05-03 'Operational provisions – Part B: Fire detection and alarm systems' and Health Technical Memorandum 06-01 – 'Electrical services supply and distribution'. Power supplies should be dedicated to the fire detection and alarm system and provide in accordance with BS 5839-1.

4.23 When designing the fire detection and alarm system, detailed consideration should be given to the potential sources of electro-magnetic 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 UwFS. The system designer should take due regard of the system manufacturers' instructions and guidance to reduce electromagnetic interference.

Minimising UwFS due to steam

4.24 The majority of steam-related UwFS occur in boilerhouses and plantrooms where steam is generated, used and distributed.

4.25 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.

4.26 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.

4.27 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.

Minimising UwFS due to smoking

4.28 Restriction of smoking by patients, visitors and staff often leads to illicit smoking. Often this occurs in areas where automatic detection is installed, and this leads to UwFS being generated.

4.29 Where smoking provision has been made, instances have been reported where insufficient extraction of cigarette smoke has allowed it to permeate to adjacent areas, activating nearby detection.

4.30 Consideration should be given to introducing a smoking policy where appropriate provision can be made for patients, visitors and staff who wish to smoke.

4.31 Such provision should be well-ventilated, clean, and sufficiently comfortable to encourage its use in preference to inappropriate areas. Measures should be introduced to mitigate any potential fire risks such as enclosure of smoking rooms in fire-resisting construction. Automatic detection should only be provided if the ventilation rates are high enough to avoid UwFS, and in any case, optical-type smoke detection should not be used.

Minimising UwFS due to patients

4.32 The instances of patient-activated UwFS 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.

4.33 Due to the increased fire risks presented by mental health patients who may either inadvertently or deliberately set fires, it is not advisable to reduce the provision of automatic detection in order to minimise UwFS.

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

4.35 Activation of break-glass 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.

4.36 Where activation of call points by patients gives rise to UwFS, 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 break-glass call points to key-operated units that can be activated only by staff keyholders.

Minimising Group 1 classified UwFS

4.37 The mobilisation of fire response teams within an organisation and/or external fire services is particularly disruptive and involves a degree of risk. Measures should be taken to ensure that mobilisation of such resources does not occur unnecessarily.

4.38 In particular, consideration should be given to the need to call on such resources when the incident giving rise to the alarm involves no threat to patients.

4.39 Provided that non-patient access areas, particularly staff residences, are remote, and fire there would pose no threat to patient safety, an alarm activation in such areas is unlikely to require same the level of

fire service as required for an alarm activated in an area accommodating patients.

4.40 On the basis of an assessment of risk, consideration should be given to delaying a call to the fire service for a short period of time to allow investigation and/or confirmation that fire service is required. Such an approach should always be used in conjunction with a "double-knock" 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 service. The activation of a call point should not initiate a delay, but should result in an immediate call to the fire service.

4.41 Where a delayed call to the fire service is to be employed, 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. Such a protocol should ensure that a delay in calling the fire service only occurs for alarms generated in areas that pose no threat to patients, and that appropriate actions are taken to mitigate risks.

4.42 Any proposed delay to a call to the fire service must first be discussed and agreed with the local fire service, and in any case such delay should not exceed 8 minutes.

4.43 Where a delayed call to a fire service is employed, alarms within the building where the activation occurs should be sounded immediately. Occupants of the building should evacuate and assemble as per local procedures, and call a fire service if appropriate.

4.44 On activation of an alarm, nominated security and/or other support staff should be sent to investigate the incident without compromising their safety. Those staff sent to investigate must have means of readily contacting the central point from which the incident is being controlled. On arrival at the area where the alarm activation occurred, attending staff should communicate the status of the incident immediately to the central control point. This allows the fire service to be summoned at the earliest opportunity, or the alarm to be cancelled and a call to the fire service avoided as appropriate.

4.45 Where attending staff cannot be certain as to the status of the alarm, a call should be made to the fire service at the earliest opportunity.

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

4.47 In a large number of organisations, tenancy agreements for staff residences include penalty clauses for those tenants that generate UwFS. Such penalties are usually financial penalties and/or ultimately eviction. Whilst these measures have shown some success in reducing UwFS, their use may be counter-productive where a delay to allow investigation is employed. Tenants responsible for generating a UwFS 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 UwFS should be reduced or in some cases waived where a tenant acts promptly to avoid an unnecessary call to the fire service.

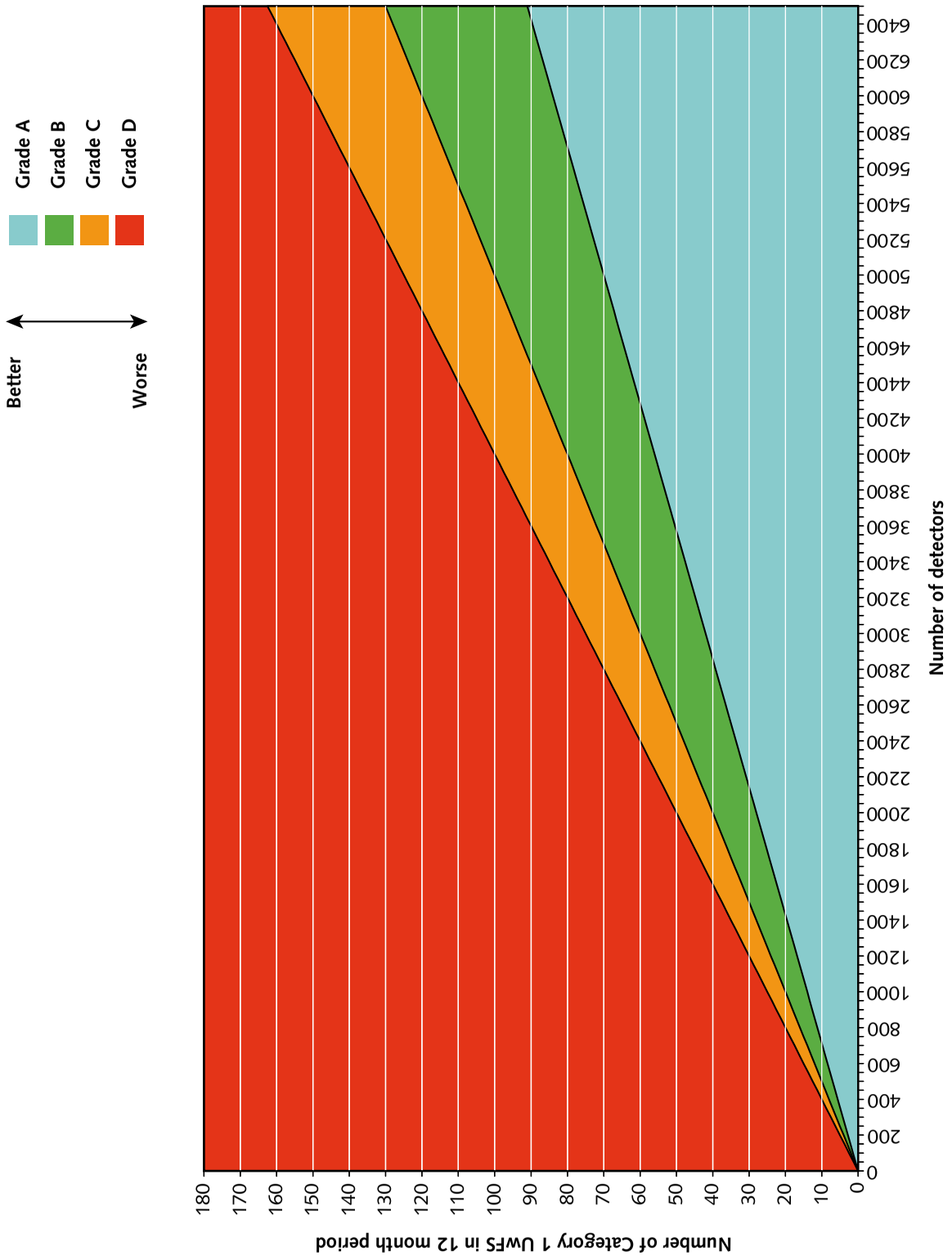
Appendix A – Categorisation of unwanted fire signals

	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
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

	CLASS	TASK FORCE DEFINITION	EXAMPLES
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 above

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

Appendix B – Unwanted fire signals performance 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 area
10	HIMO (houses in multiple occupation)	10	Communal areas
11	Dwelling	11	Storage area
12	Prison/Police/Fire/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 Area
16	Emergency services		

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 central sterile services department
P14	Pharmacy	S14	IT Department
P15	Operating theatre	S15	Education
P16	Retail area	S16	Residence
P17	Restaurant	S17	Garage

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 pool	R30	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
R17	Servery	R36	Laboratory
R18	Office	R37	Bedroom (residence)
R19	Storeroom	R38	Other (state)

Appendix D – Incident briefing information

UNWANTED FIRE SIGNAL BRIEFING

Time: **Date:**

Location: **Incident duration:**

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) ☐

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 Co-ordinator

Appendix E – Fire/UwFS incident report

REPORT OF INCIDENT
(Refer to Figure 2) ☐ fire ☐ unwanted fire signal

Summary: *To be completed for both types of incident*

Healthcare Organisation:
Time of incident:
Duration of incident:
Building of origin:
Time of call to Fire Service:
Age of building:
Time Fire Service arrived:
Date of incident:
Estimated cost of damage/disruption:

Location details:

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

Unwanted fire signal incident details:

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

Fire Service attendance: Yes ☐ No ☐

Fire response team attendance: Yes ☐ No ☐

Fire Service classification (If different from above): ☐

Fire incident details

Fire discovered by *To be completed for fire incident*

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

Method of extinguishment *To be completed for fire incident*

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

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)

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

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

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)

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 item ☐ Street/main corridor ☐ Other floor(s) ☐ Other (please specify)
☐ Corridor(s) ☐ Adjacent department(s) ☐ Roof void(s)

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:

Extent of evacuation *To be completed for both types of incident*

☐ 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

Fire response team *To be completed for both types of incident*

Response team involvement Yes ☐ No ☐ Number in team Duration of involvement

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

Persons involved *To be completed for both types of incident*

Number of people in room of origin	☐ Patients	☐ Staff	☐ Visitors
Number of people evacuated from room	☐ Patients	☐ Staff	☐ Visitors
Number of people evacuated from department	☐ Patients	☐ Staff	☐ Visitors
Number of people evacuated from floor	☐ Patients	☐ Staff	☐ Visitors

Injuries to persons	Patients			Staff		Visitors	
Injuries caused by	Killed	Injured	Condition aggravated	Killed	Injured	Killed	Injured
Burns							
Smoke inhalation							
Evacuation							

Near miss information

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

Area to be next affected *To be completed for fire incident*

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

Estimated time before next area evacuated: Estimated duration of evacuation to next area:

Additional comments

Include sequence of events with brief description of building construction (if relevant). Provide sketches if necessary and use additional sheets if required.

To be completed for both types of incident

Completed by:

Name: . . . . . Position: . . . . . .

Signature: . . . . . Date: . . . . . .

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