
Since the introduction of the Fire & Unwanted Fire Signals Incident Reporting System in 2004, all Trusts in Wales have been required to report details of incidents within their estate using the online system. During the three year period between 1st January 2004 and 31st December 2006 a total of 257 fire incidents and 4693 unwanted fire signals were reported.

The trend is shown in Figures 1 and 2 (opposite).

An analysis of the data submitted has been compiled in the Welsh Health Estates report – Fire Incidents and Unwanted Fire Signals 2004-2006, dated June 2007, which was issued to the Service under cover of WHEN 07/10. This article highlights some of the salient points and trends identified in the report. The full report can be downloaded from the Welsh Health Estates intranet site at http://howis.wales.nhs.uk/sites3/Documents/254/FireStatsReport2006FinalV.pdf

Fire Incidents

The three most prominent causes of fire incidents are deliberate (arsen) followed by electrical equipment failure and third smoking. The full range of causes is shown in Figure 3.
**Deliberate (Arson)** During the three-year period 26% (66 incidents) of all reported healthcare fires in Wales were attributed to deliberate fire-raising.

Of these incidents, 66% (44) occurred in mental health wards where, typically, the materials first ignited were 27% (12) waste, 16% (7) bedding and 16% (7) other textiles. An additional 6 incidents were started by mental health patients being treated in general medical wards.

Mental health facilities are identified as being particularly vulnerable with disturbed patients occasionally igniting waste, clothing or bedding, as illustrated in Figure 4.

Figure 4: Wrexham Maelor Hospital

Premises that are only occupied during the day, for example, clinics and health centres, can be particularly vulnerable, where the potential for extensive damage can and does occur through delayed detection and intervention. This issue was highlighted recently when North Cardiff Medical Centre suffered extensive damage following an incident on 9th August. A bin placed adjacent to the building was maliciously ignited and the resulting fire engulfed the roof, totally destroyed the first floor and caused extensive damage to the remainder of the building as can be seen in Figures 5 and 6.

![Figure 5: Refuse container ignited below fascia](image1)

Figure 5: Refuse container ignited below fascia

Unfortunately, the incidence of arson-related fires reported across the NHS estate in Wales has marginally increased during the last three years. *Health Technical Memorandum 05-03: Part F ‘Arson prevention in NHS premises’* (formerly Fire Practice Note 6) provides guidance on preventing, controlling and detecting arson. The document also recommends that arson prevention should form a routine part of all fire training given to employees. Furthermore, the potential for arson should be addressed in the premises fire risk assessment.

**Electrical equipment failure** is the second highest cause of fires, accounting for 24% (62) of incidents. In addition, lighting and electrical cables accounted for a further 10 fire incidents, which highlights the importance of portable appliance testing and regular fixed wire installation testing.

The main causes of electrical fires are overloading of components, typically motors, and restricting heat dissipation, for example, fluorescent light fittings where, in some cases, thermal insulation was laid too close to the fittings.
Smoking-related incidents accounted for 22% (56) of all fire incidents. Waste was identified as the material first ignited in 37 of these incidents where, typically, carelessly discarded cigarettes had ignited the contents of waste bins.

Over half of smoking-related incidents occurred in mental health wards, highlighting the importance of adhering to managerial controls where smoking is permitted in designated areas.

It is anticipated that the introduction of the Smoke-free Premises etc. (Wales) Regulations 2007 will reduce smoking-related fire incidents. However, residential mental health facilities are exempt from the regulations and there is also a perceived risk of illicit smoking occurring in concealed areas.

Cooking accounted for 11% (29) of incidents, with over half of these occurring in the kitchen areas of staff residences where, often, ignition through unattended food left cooking was found to be the cause. Unlike the example in Figure 7, in a significant number of these incidents, smoke spread was not contained in the room of origin, due to fire doors being held open.
Unwanted Fire Signals (False Alarms)

Between January 2004 and December 2006, a total of 4693 unwanted fire signals were reported. These incidents create an unnecessary burden for NHS organisations in terms of disruption to patient care, delivery of service and response procedures, as well as placing a strain on the fire services’ resources attending the incident.

Figure 8 (see page 14) shows the range of causes of unwanted fire signals. The three most prominent causes were system faults, followed by cooking and other environmental effects. A large proportion of these UwFS are directly attributed to some form of human error and there is, therefore, potential to manage or design-out these causes. The data also indicates that, for both fire incidents and UwFS, incidents associated with mental health units and staff residences are significant in a number of areas.

System faults account for 27% (1252) of incidents, which emphasises the importance of correct specification, design and installation of automatic fire detection systems. Systems are becoming more reliable against unwanted signals with the introduction of multi-state detectors and ‘intelligent’ technology that can identify typical fire patterns and discriminate between real fires and typical false alarm phenomena. However, system reliability is dependent on the correct design and installation supported by ongoing robust maintenance regimes.

Cooking accounts for 18% (861) of incidents. This is the second highest cause of UwFS and is attributed to burnt/over-cooked food, predominantly toast, 56% (479) of which occurred in local kitchens, servery/dining areas and catering departments. In over 20% (177) the detectors activated were located in corridor/circulation areas adjacent to the rooms where the cooking was taking place, which highlights the importance of preventing fire doors from being wedged open. In addition, 25 incidents resulted from cooking in offices, which often highlights the inappropriate location of toasters.

Of the 861 UwFS, 40% (347) of incidents occurred in staff residences located within the curtilage of the hospital sites. Whilst these should be reduced, the high ratio of staff residence-related UwFS distorts the actual healthcare statistics. Work is progressing to separately identify these incidents.

Other environmental effects account for 17% (801) of incidents. The majority of these were attributed to steam, dust and, occasionally, accidental activation through the use of aerosols such as deodorant and hair spray. With these incidents, the emphasis is on staff awareness training into the causes of activation of detectors.

Conclusions and recommendations

The collection of data enables trends to be identified and can be used to support and influence best practice. The burden of fire and unwanted fire signal incidents is widely acknowledged and stakeholders are continuing to address these incidents in a proactive way. To complement this the Welsh Assembly Government’s Department for Health and Social Services and the Chief Fire Officers’ Association (Wales) are in the process of developing a fire safety concordat, for working together in partnership. It is intended that this will address the issue of fire incidents and UwFS as a focal point of discussion.

Healthcare organisations should continue with their endeavours to mitigate these adverse incidents and in particular address the following actions referenced in WHEN 07/10:

- Ensure the appointment of a named ‘responsible person’ for the detection and alarm systems as stated in BS 5839:1 2002 Fire Detection and alarm systems for buildings - Code of practice for system design, installation, commissioning and maintenance.
- Ensure robust maintenance regimes are in place for all detection and alarm systems in accordance with BS 5839.
- Ensure all incidents throughout the estate are accurately investigated and reported in accordance with HTM 05-03: Part H and, where applicable, influence future fire management procedures.
- Utilise and update the performance score function within the online reporting system as required by WHEN 04/22 which will form the basis of future discussions with the Fire Authorities.
- Promote a greater awareness by staff, patients, visitors and contractors on the adverse practices that cause unwanted fire signals, especially in mental health facilities and staff residences.

To support the NHS in Wales, Welsh Health Estates intends hosting an awareness training day focussing on current standards, technological advances, user responsibilities and the Fire and Rescue Services’ perspective. In addition Welsh Health Estates will revise the reporting system to enable Trusts to separately identify incidents originating in staff residences.

Further information on managing fire safety and minimising fire incidents and unwanted fire signals can be found in the HTM 05 Firecode series of publications contained in the publications section on the Welsh Health Estates intranet site.

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