

# Importance of regular inspection stressed

Andrew Poplett, a highly experienced engineer with over 28 years' experience in healthcare building services engineering, considers some of the key tenets of good fire safety practice in healthcare premises, noting that fire safety is a core element and consideration within CQC inspections, and under the NHS Premises Assurance Model (NHS PAM). He warns those responsible for fire safety against letting key elements 'fall between the cracks'.

**F**ire prevention and protection within healthcare environments have always been high profile areas. Almost all scenarios which involve a fire are recognised as potentially catastrophic, and everyone accepts that fire precautions and risks must be carefully managed. Against this background there have been, over recent years, a number of high profile issues and investigations arising from fires within hospitals and related problems. These issues were highlighted in the 'Dear Colleague' letter on Fire Safety Duties from the Department of Health dated 31 January 2013 (Gateway reference 18654) to all NHS Trust Chief Executives. Subsequently there has been a further recent notification through the Estates & Facilities Alert system (ref DH/2014/003 dated 21/10/2014), which highlighted the connection of the HTM standards as a means of demonstrating compliance to the Regulatory Reform (Fire Safety) Order 2005 legislation.

## Risk of 'falling between the cracks'

Most organisations are familiar with their obligations for maintenance and inspection of areas of fire precautions, such as fire alarm systems, emergency lighting, fire extinguishers, and fire doors. These tend to be actively maintained, and

under near constant review. All fire officers and fire wardens are aware of these systems, and inspect them on a regular basis, with many, if not all, being managed through a routine PPM system. The vast majority of estates professionals are also very aware of the issues relating to buildings and building services which impact on the integrity of fire safety. Nevertheless, there are some critical elements of fire prevention which can 'fall between the cracks', and be overlooked or assumed to be complete, but are not regularly inspected. We will look at these in turn, beginning with the considerations around passive fire and compartmentation.

## Compartmentation/stemming and inspection

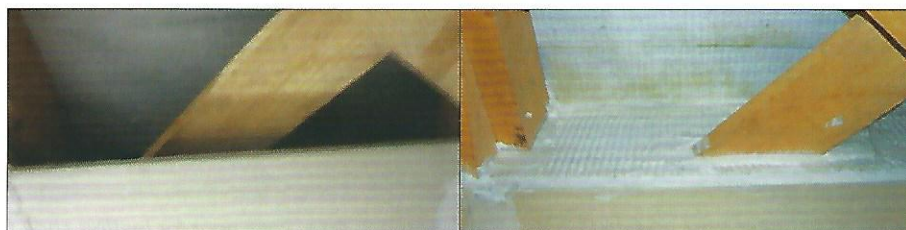
All healthcare buildings are required to have an established fire strategy and, as such, the identification of fire compartments which separate and protect areas within a building to minimise and prevent the spread of fire is key. These compartments separate high risk rooms from other areas, and provide increased protection to escape routes. This is achieved by using typically half-hour or one-hour fire barriers. These barriers are established at a design stage, and are the foundations for all of the fire prevention and detection systems used to protect

patients, visitors, staff, and property. Figure 1 shows a typical installation of wall sub-compartment within a loft space before and after rectification.

Hospitals are, by their very nature, dynamic buildings, with many areas changing use and layout over time to reflect the changing needs of the clinical services. Often these changes are seen as cosmetic, and do not always adequately review and reflect the impacts that they have on the fire strategy or original design intent. Moreover, when changes are made, they often involve the installation or re-routing of services concealed above ceiling voids, where compartmentation is often disturbed or damaged and not properly re-instated. Many of these works are undertaken by contractors who may not appreciate the importance of the fire stemming or barriers (such as IT or telecoms installations), and there is therefore a need to undertake regular (annual) inspections of all compartmentation to ensure that protection remains in place and appropriate. This is an obligation of the revised HTM 05-02, clauses 5.38 & 5.39.

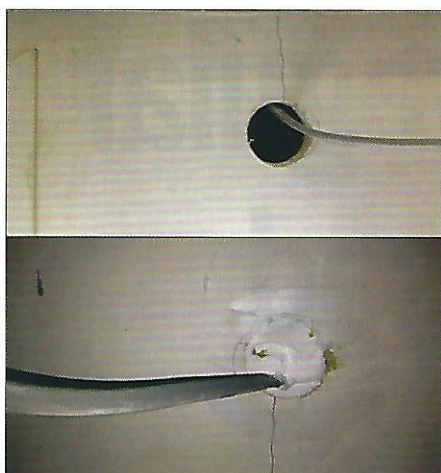
## Repairs and stemming – what to look out for

Illustrating what can happen, Figure 2 shows a typical cable installation before and after rectification. It is critical to ensure that, where repairs or stemming have been undertaken, the work has been done using appropriate materials. In particular, expanding 'builders' foam' is widely used, but if this is used it must be the fire rated or 'pink' foam, and not the general or 'yellow' type, which is highly flammable. All materials used for the construction of fire compartments should have test certification (typically to BS 476 or equivalent).



*Figure 1: A typical installation of wall sub-compartment within a loft space before and after rectification. The identification of fire compartments which separate and protect areas within a building to minimise and prevent the spread of fire is key.*





**Figure 2: A typical cable installation before and after rectification.** Some works – such as IT or telecoms installations in healthcare premises – are inevitably undertaken by contractors who may not appreciate the importance of the fire stemming or barriers.

### Contractor control

Whenever contractors or direct labour are tasked with undertaking installation or refurbishment works (including minor works), consideration needs to be given to the potential impact that the planned works may have on the fire strategy and, if appropriate, a review of the strategy needs to be included within the project plan. It is also essential that, after works are completed, and prior to release of payments, works be inspected (including above ceiling spaces) to ensure that fire barriers are complete and safe. To this end it is recommended that works involving penetration or adjustment of fire compartmentation should be controlled via a 'permit to work' system which incorporates, and formally records, inspection and handback processes.

### Designated Duty Holders

The revised HTM 05-02, places a responsibility on Designated Duty Holders to ensure that individuals or companies undertaking any inspections or work are competent to undertake the tasks and duties assigned to them. It is not a defence to say that the liability has been passed to a third party because a contract

was in place. Ultimately, all designated Duty Holders must be confident that the people managing their systems are competent, qualified, and suitably experienced to do so.

The revised standard makes those responsible for the management of premises clearly liable for the safe assessment and management of the associated fire risks. It also makes it clear that Duty Holders should obtain suitably qualified expert advice through the appointment of an independent Authorised Engineer (Fire). This outside expert advice is intended to support internally appointed fire safety officers and other staff, and to provide independent assurance through an audit process to Duty Holders.

In addition to compartmentation, there are numerous other areas where regular inspection and maintenance are required, either as specified by the HTM 05 series guidance, or BS 9999 (2008). Again, we will focus on each, beginning with fire and smoke damper testing

### Fire and smoke damper testing

All fire dampers should be visually inspected and drop tested to ensure safe operation on an annual basis. This drop test requires there to be adequate access, which is often a significant challenge.

#### When is an access door not an access door?

An access door for testing and re-setting fire dampers must be large enough to gain access, and not blocked off by other services. Poor installation and co-ordination of services in ceiling voids and plant rooms has always been, and will continue to be, a challenge. However without appropriate access (a good example of poor access is shown in Figure 3), the systems are not compliant, and cannot be certified as such.

### Fire and smoke damper testing

Smoke dampers must also be tested, but on a quarterly basis, as they are used in place of fire dampers to provide a more positive means of control (i.e. motorised and not just spring-loaded open or closed, as with fire dampers). This quarterly inspection is

It is the healthcare organisation's responsibility to ensure that the tests are completed and recorded appropriately

often done remotely by means of a central control panel. However it should include a visual inspection to ensure that the damper actuator is still connected to the damper shaft, and that the damper blades are not damaged or missing. During both of these inspection and testing regimes, general maintenance and visual inspection of internal duct cleanliness, and surrounding fire barrier compartmentation integrity, can be conducted.

### Smoke extract systems

Some buildings have forced or natural smoke extract systems – typically either by means of forced air ventilation systems, or motorised smoke-activated fresh air damper systems. These systems should be inspected and tested on a quarterly basis to ensure safe and appropriate operation. Where such systems are installed to protect escape routes, they should be tested weekly.

### Fire hydrant testing

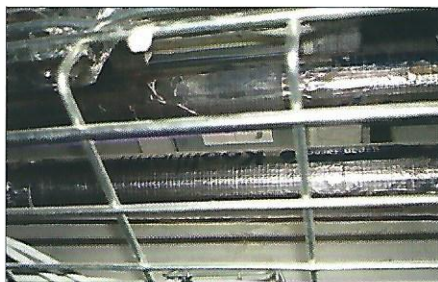
Private fire hydrant mains should be inspected weekly, both to ensure that access is maintained, and that valve chambers do not become blocked or silted up. In addition, annual verification of flow rates and pressures should be taken to demonstrate the effectiveness and ensure adequacy of flow. These tests should be undertaken in agreement with the local fire and rescue service. However it is the healthcare organisation's responsibility to ensure that the tests are completed and recorded appropriately.

### Fire doors and inspections

Fire doors are well recognised as requiring regular routine inspection, and most organisations incorporate such inspections within weekly fire warden inspection



**Here (left) a contractor has made an aperture for the subsequent installation of ventilation ducting, but, as shown (right), the installer has subsequently selected a different location for the ducting. There is a clear need to regularly inspect all compartmentation to ensure that protection remains in place and appropriate.**



**Figure 3: An access door for testing and re-setting fire dampers must be large enough to gain access, and not, as shown here, blocked off by other services.**



regimes. However, it is important to note that the level and extent of inspection should meet the requirements of BS 8214 (2008). This inspection may be considered more detailed / technical than is appropriate for some fire wardens, and consideration may need to be given to allocating or appointing suitably qualified / experienced personnel to undertake these inspections. Generally, major traffic or escape routes should be inspected at least quarterly, with all other fire doors inspected on a six-monthly basis. The recommended inspections cover all aspects of fire doors, including labels, leafs, frames, intumescent seals, hinges, closers, hold-open devices, locks and ironmongery, glazing, and gaps / thresholds. In addition to the fire door, consideration should be given to including any final or emergency exit doors, which, while strictly speaking, do not need to be classified as fire doors, do have a range of specialist features which should be routinely inspected and tested for correct operation.

### Refuge alarms

Many healthcare buildings use a strategy of progressive horizontal evacuation for the protection of those within the facility and, as a result, it is not uncommon to have designated refuge areas where people can wait in an area of protection while resources are used to take them to a place

of ultimate safety. These areas should have a system of communication installed to enable two-way communication and reassurance to be provided in the event of an evacuation. This equipment should be tested on a weekly basis to ensure safe and correct operation.

### Conclusion

Fire safety is one of the highest priorities for all healthcare organisations, given the nature of the people in our care, and the significant consequences relating to a fire situation. It is a core element and consideration within CQC inspections and under the PAM system of self-reporting (S15: 'safe and compliant with well managed systems in relation to: Fire Safety'), and NHS organisations are required to make an annual statement of compliance to provide assurance that the buildings under their control are safe and appropriately managed.

The areas highlighted in this article are not intended to represent a comprehensive schedule of areas which require consideration for fire precaution maintenance, but I hope to at least stimulate thought, review, and debate, to ensure that fire remains an ever-present consideration among the myriad of other priorities and pressures faced and managed on a daily basis by estates professionals.



## Andrew Poppett

Andrew Poppett IEng, MIHEEM, ACIBSE (pictured) is an experienced engineer, with over 28 years' experience in the healthcare building services engineering profession, 18 of which were spent in the NHS. He is now an independent advisor to the NHS and other private healthcare estate organisations in his role as an Authorised Engineer for both specialist ventilation and water quality, and provides specialist support and advice on all aspects of estates and property management, including fire safety.



## FAULTY FIRE DAMPERS CAN KILL! WHEN WERE YOURS LAST TESTED?

### Fire Damper Drop Testing (BS 9999)

Ductwork can unfortunately transfer flame and smoke very quickly through a building in the event of a fire. The heat build up inside the duct can cause any combustible material in close proximity to the ductwork, such as roof joists, to burst into flames. This can cause considerable damage to the building resulting in significantly higher insurance claims and present fire fighters with a more difficult task than need be.

Fire dampers therefore are a vitally important part of any ventilation system and need to be part of a fire damper maintenance programme to ensure correct operation.

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