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How post-Grenfell fire safety has 'changed for good'

Dr Louise Webb, Project director, and David Butler, Authorising Engineer – Fire Safety, of DRLC, discuss the changes in fire safety brought about since the Grenfell Tower fire in June 2017, and some of the key legislation, standards, and guidance, in this key area for healthcare estates management teams to take note of.

Fire Safety changed for good in June 2017, when the Grenfell Tower fire caused 72 people to lose their lives, and a further 70 to be injured, with 223 people escaping the blaze. The disaster prompted a government inquiry which was chaired by Dame Judith Hackett, and reported in May 2018 in a document titled *Building a safer future: Independent review of Building Regulations and Fire Safety: Final Report*. Dame Judith Hackett's report following the inquiry into this incident has resulted in a new Building Safety Act, which came into force in April 2022. This legislation raises the bar for competency requirements for all those involved in high-risk buildings, and shines the spotlight on culture change within the construction industry in order to – as Dame Hackett comments in the Executive Summary – ensure that 'residents are safe and feel safe'.¹

One of the report's main findings was that a mixture of ignorance of the regulations and guidance, a disregard for quality in construction driven by cost-cutting, a lack of clarity as regards roles and responsibilities, and woeful regulatory checks, had led to a culture within the sector which could be regarded as the 'lowest common denominator', caused either through lack of knowledge, an uncaring attitude, or because the regulatory system in place at the time did not reward or encourage good practice. It concluded that there was insufficient focus on delivering the best quality building possible in order to ensure that the residents were safe, and also that they felt safe.

Since the disastrous fire in Grenfell Tower, fire safety guidance and legislation have moved on and changed to encompass the lessons learnt from this incident. A new regulatory body known as the Building Safety Regulator² has been established as a part of the Health and Safety Executive (HSE). There are now new regulations regarding fire safety in buildings,³ in addition to new regulations for planning requirements and fire safety,⁴ and changes to existing building regulations.⁵

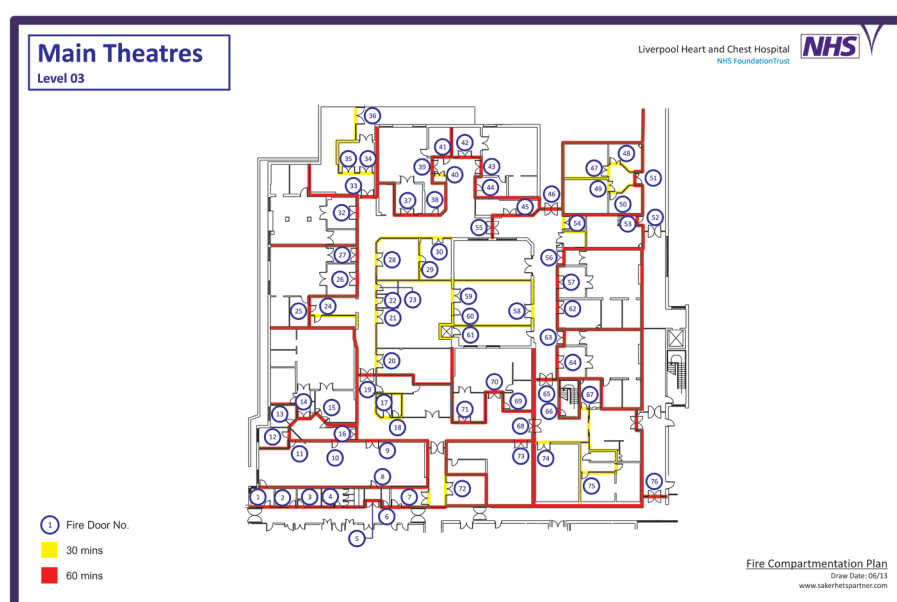


Figure 1: Fire compartmentation plan for an NHS operating theatre department.

Fire incidents in the NHS

In March 2020 the Estates Returns Collection (ERIC) NHS data showed that the total number of hospital sites in England was 1,261.⁶ The definition of an NHS England hospital site is either a site with a footprint of over 500 m², or a site with over 10 inpatient beds. The new regulations define 'higher-risk buildings' as those structures that are more than 18 metres in height or have more than seven storeys – due to the height of the building being seen as a significant factor affecting the necessary fire precautions.

In 2020 there were 274 NHS England hospital buildings over 18 metres in height. A further 714 hospital buildings were between 11 metres and 18 metres high. Fires recorded in line with the requirements of HTM 05-01 totalled 1,175 in this same period. There were 19,556 false alarms, of which 5,742 resulted in attendance by the Fire and Rescue Service. In the same year 51 people were injured in hospital fires, and two during evacuations. There were no deaths from hospital fires in this period.

Keeping a large NHS hospital estate safe

John Calvert, Hospital Fire Safety manager at The Royal Brompton and Harefield, explains the issues involved in keeping a large NHS hospital estate safe from fire: "The Estates and Capital projects teams, along with myself, meet on a weekly basis, and we employ the services of an independent Authorising Engineer for Fire Safety. Together with my appointed Deputy Fire managers at each site we effectively deliver fire safety across our Clinical Group, with the intention of ensuring continual improvement to maintain the safety of staff, patients, and visitors.

"Our Trust has recently merged with Guy's and St Thomas' NHS Foundation Trust, which makes robust policies and procedures even more important as the two Trusts learn to work together, and in particular throws the spotlight on the need for robust consultation procedures with fire safety management for all capital schemes and major refurbishments."

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A smoke alarm being tested with an ionisation tester.



A manual call point which will activate a fire alarm when the glass is broken.

New legislation

In April 2022 the Building Safety Act became an Act of Parliament. This legislation came about as a direct result of the Grenfell Inquiry report findings. While the Act is mostly concerned with addressing the risk to life from fires in high-risk residential buildings, a number of its clauses apply to hospital premises. The Act is intended to fundamentally reform the legislation around the design and construction of all buildings. It is also aimed at improving the fire safety in higher-risk residential buildings.

The Act uses the concept of 'duty holders', and sets out a framework of duties for these people and organisations. These duty holders are the stakeholders who commission, design, and undertake building work to which Building Regulations apply. Using terms used in the most used forms of building contract, the duty holders are the client, principal designer, designers, principal contractors, and contractors.

The new framework requires that duty holders will need to work together to plan, manage, and monitor the design work and the building work, ensure they cooperate and communicate with each other, coordinate their work, and have systems in place to ensure that building work - including design work - complies with all relevant Building Regulations.

Competency requirements

The regulations also set out the competence requirements that those duty holders will need to have to undertake work and ensure that those they appoint are also competent to carry out that work. The new standard applies to buildings that are at least 18 metres in height, or have at least seven storeys, and have a minimum of two residential units. It also applies to care homes and hospitals meeting the same height threshold during design and construction, but, importantly, not during occupation.

The advent of the new Building

Regulator signposts a fresh approach to regulating building safety. Although the scope of the Act is confined to a subset of particular buildings, its approach is almost certain to affect the construction industry across the board, as it takes into account the inquiry response to the Grenfell Tower fire, and applies the findings to the construction and fire safety industries in general.

A Competency Steering Group has been working with a number of stakeholders to look at ways of improving competency within the industries that make up the

construction sector, particularly in relation to fire safety. The stated aim of this working group is to create a template for improving competency, and in so doing encourage a change in the culture for those covered by the new regulations. The Competency Steering Group has produced a report: *Setting the bar: A new competency regime for building a safer future.*⁷

Implementation of the new Competency Regime

The new system involves putting in place a comprehensive suite of competence

Organisation type	Typical characteristics	Example
Power culture	<ul style="list-style-type: none"> • Small entrepreneurial organisations • Revolves around focal people • Little bureaucracy • Moves & reacts quickly 	Single person Authorising Engineer company
Role culture	<ul style="list-style-type: none"> • Characterised by procedures and pre-defined roles • Instructions go from top down • Stereotyped by bureaucracy & hierarchy • Slow to react & change • Stable environments - typically Government depts - e.g. NHS, Civil Service 	NHS Trusts
Task culture	<ul style="list-style-type: none"> • Job or project orientated • Match people to jobs • Team culture • Individuals exert control over jobs • Adaptable to change 	Small construction companies
Person-centred culture	<ul style="list-style-type: none"> • Exists to serve the individual • Control by mutual consent • Influence is shared • Contrasts with 'Power culture' - in 'Person culture', each person can be the focal point, depending on the circumstances • Adaptable to change 	Architectural partnership

Table 1: Charles Handy's framework of organisational culture types⁸ describes four organisational types.



Toasters left on too long, or in faulty condition, are a common cause of 'false fire alarms' in hospitals.



A Dorgard sound-activated door close device.

Image courtesy of DoorGuard

standards. These standards will be implemented by mandating third-party assessment for individuals and companies involved in the construction of buildings covered by the Building Safety Act, which includes hospitals and care homes while they are being designed and built.

The report positions the new competence frameworks being implemented for higher-risk buildings as a 'starter for ten' for the whole of the built environment, and foresees a 'trickle-down effect' which would see an improvement in safety standards across the whole sector, and a concomitant change of industry culture. This may or may not be a realistic aspiration, as changing the culture of an organisation is one of the most difficult organisational changes to achieve.

Charles Handy's framework of organisational culture types⁸ describes four organisational types – power, role, task, and person-centred. The construction industry is an amalgam of all of these organisational types, as Table 1 shows.

The ultimate goal of this new set of standards is to ensure that all those people whose work on higher-risk buildings is likely to materially affect safety outcomes, or who work unsupervised on these types of buildings, should have the skills, knowledge, experience, and behaviours set out in these competence frameworks. In the first instance this requires the co-operation and engagement of fire engineering professionals, and all the industries and individuals involved in fire risk management, which includes Authorising Engineers for Fire Safety.

False alarms from remotely monitored fire alarms are a problem. They use fire and rescue resources unnecessarily, and, in addition to this, result in the fire service not being available for genuine emergencies, and put the public at risk from fire appliance road movements

Firecode Suite HTM 05-01, HTM 05-02, and HTM 05-03⁹

The guidance provided in the Health Technical Memorandum 05 series of standards is known as the Firecode suite. HTM 05-01 was first published in 2006, and last updated in 2013. It deals with managing fire safety in healthcare settings. British Standard 9999 (BS9999)¹⁰ is also used as a standard for Fire Safety, and BS9997 as a standard for Fire Risk Assessment.¹¹

HTM 05-01 – Managing healthcare fire safety

The guidance included in HTM 05-01 is being reviewed and revised. It is expected that the section on fire training will be updated, and include an emergency plan and evacuation exercise for staff, which may be a document in its own right.¹² This section gives guidance on fire training, and it will in future include a section on eLearning. Management of training, fire risk assessment, maintenance, and projects, will rest with the appointed Fire Safety manager. Regular Fire Safety Committee Meetings will be proposed, with the membership of this committee to include the director responsible for fire safety otherwise known as the Designated Person (DP), Estates and Facilities staff, and any relevant Project managers, and a representative from the appropriate Fire and Rescue Service.

It is also envisaged that the revised document will provide guidance that underpins the fire safety policy, and includes maintenance as a risk-assessed system which takes into account the

particular environment in a healthcare setting. Example protocols which will be included in the updated document and may be supported by the HTM 05-03 Part B include:

- Fire doors – annual inspection is recommended.
- Fire dampers – annual inspection is recommended.
- Fire/smoke dampers – annual inspection is recommended.
- Fire compartmentation.
- Emergency lighting.
- Facilities for firefighters.
- Fire Alarms – including 'cause and effect' strategy.

Experiences of an expert

One of those with particular fire safety expertise, especially around fire-stopping, whose company works closely with DRLC, is Maggie A Treacy-Hales, MD of F7 Fire Safety. She said of her experience of managing the installation of fire safety systems in the NHS: "I have worked in numerous healthcare settings over many years, inspecting the live installation work of fire door and passive firestopping contractors. I've also inspected such works after completion, where unfortunately defect liability has expired, and the client is left to pay for expensive remedial works. Post-Grenfell one might have expected that contractors – including third-party accredited contractors – would be extra thorough in ensuring that they are installing compliant works.

"However, it is my experience that many fire door and passive fire-stopping works are still being installed non-compliantly. The best way to ensure that expensive works are being installed right first time is to engage with a specialist Clerk of Works experienced in this field, such as our company, F7 Fire Safety."

HTM 05-02 – Fire safety in the design of healthcare premises

HTM 05-02 was first published in 2007, and last updated in 2015. This

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document deals with fire safety in the design of healthcare premises. The National Fire Chiefs Council (NFCC) has made the comment that this guidance should be updated to include stronger recommendations for areas where automatic fire suppression systems (AFSS), which includes sprinkler systems, should be used – for example, to support areas where a progressive evacuation strategy is used in the event of a fire. They also commented that sprinkler systems should be considered in any project which involves significant refurbishment of a hospital or healthcare building. It has been argued by developers that there is a risk that sprinklers could lead to the spread of *Legionella* bacteria, and thus precludes their use in healthcare buildings. This risk has not been widely researched.

A counter-argument to this perceived risk would be that the water used for fire suppression is a separate water main to the main supply, and the sprinklers are only used in the event of a fire. There is a dearth of research in this area, which could make a good PhD thesis for an engineer.

Need for a derogation

The NFCC has also suggested that where suppression systems are fitted it is acceptable to apply a derogation for other fire safety systems, particularly the level of structural fire compartmentation. However, they have also noted that where sprinklers are not fitted, a new requirement is introduced to make patient bedrooms fire-rated.

David Butler, AE Fire Safety for DRLC, says of this: “HTM 05-01 is just a starting point for any AE Fire Annual Audit which looks at the organisational Fire Safety Management System (FSMS) in place, as detailed in BS 9997. My 30 years’ experience in the Fire Service provide me with a wealth of experience as to what to look for. I also worked as a Fire Safety manager in the NHS, so I do understand the constraints that Trusts are working under. I like to interview as many relevant stakeholders as I can when I do an Annual

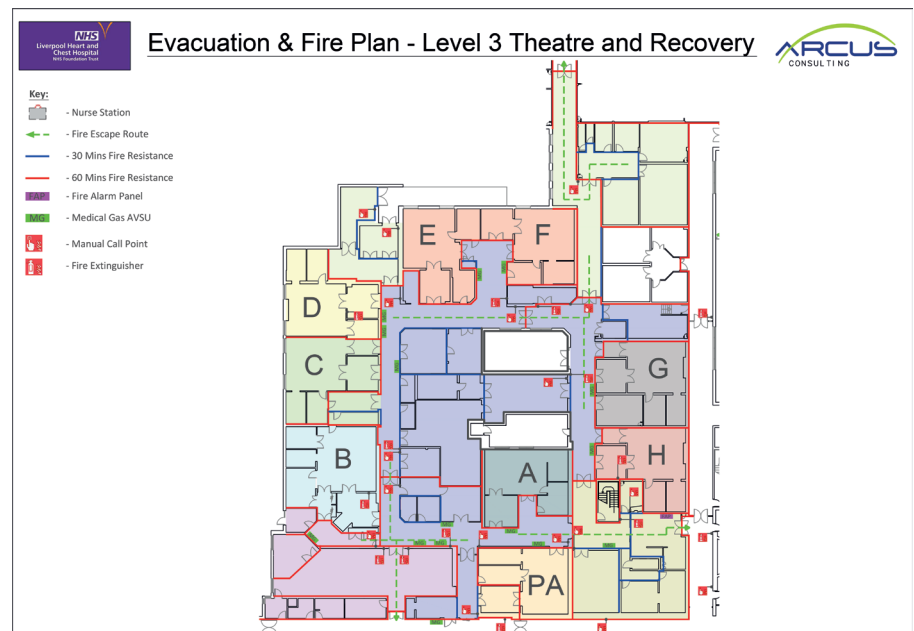


Figure 2: An evacuation and fire plan – Level 3 Theatre and Recovery.

Audit to get a good overall picture of the site. I describe my approach as being a ‘critical friend’ to the client. By this I mean that if I document any defects in the management systems, I am ready and willing to advise on how to implement remedial actions.

‘Pushing at an open door’

“With any luck the client will ask us for a repeat Annual Audit the following year, where I can document the year-on-year improvements. I have never visited a Trust that was not committed to the best quality fire safety systems, and that makes my job so much easier, as I am always pushing at an open door.”

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

HTM 05-03 is concerned with the operational provisions for fire safety in healthcare buildings, and is divided into 11 parts, alphabetically numbered from A to M. Fire detection and alarm systems are covered in Part B, and

the topic of reducing false alarms in hospital premises is covered in Part H. Fire alarm maintenance in some areas of a hospital environment can pose issues. An example is maintenance of fire alarms in an intensive care unit, where the noise and disruption caused by essential fire alarm maintenance can be deemed unacceptable. An article in *Health Estate Journal* pointed to the benefits of aspirating fire detection systems – which can be designed so that planned preventative maintenance can be carried out with little access to patient areas.¹³

HTM 05-03 – Part H – Reducing false alarms

False alarms from remotely monitored fire alarms are a problem. They use fire and rescue resources unnecessarily, and, in addition to this, result in the fire service not being available for genuine emergencies, and put the public at risk from fire appliance road movements.¹⁴

The number of false alarms reduced from a peak of 393,000 in the early

2000s, to a low of approximately 211,000 in 2015. It has stayed around this level, with the proportion of total incidents dealt with by the Fire Service in England in the year ending September 2021 which were false alarms being 41%.¹⁴

The Building Research Establishment (BRE) has reported that false alarms generated from remotely monitored fire detection and fire alarm systems have cost industry and Fire and Rescue Services an estimated £1 bn in the UK in the period 2020 to 2021. This situation leads to deleterious effects on people's confidence generally on the significance or otherwise of a fire alarm activation. In buildings with high staff turnover, such as hospitals, a proven method of reducing false alarms is ensuring that there are proper procedures in place to train new staff on how to deal with unwanted fire signals.¹⁵ Close co-operation between local Fire and Rescue Services and the Responsible Person for fire safety within NHS Trusts has been effective in seeing the number of false alarms across the sector decline.

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Louise Webb

Louise Webb MBChB, MSc Computer Studies, PGCert, Chartered IT Professional, Fellow of the British Computer Society, APMP, and Associate of SVHSoc, is a Chartered IT professional, and Project director of DRLC, Consulting Engineers. DRLC works mainly with NHS Trusts supplying them with technical expertise and Authorising Engineers in Ventilation, Fire Safety, Pressure Systems, and Medical Gases. Louise started her career as a medical student at Edinburgh University, before gaining an MSC in Computer Studies at Sheffield Hallam University, and spending five years at Sheffield heavy engineering company, Davy McKee.

She later worked for BT as a senior project manager, gaining an NVQ Level 4 in Project Management, and helping Google get its first UK servers installed. She also managed the implementation of firewalls for FTSE100 financial services companies, and was instrumental in rolling out broadband to schools in Yorkshire and Humberside.

She later set up DRLC, winning work from clients including Leeds City Council and the Department of Health. Having been asked to create an online project management training module by Sheffield Hallam University, she enjoyed teaching, going on to teach at Hallam University, the University of Sheffield, the University of Bedfordshire, and Anglia Ruskin University. As Project director, Louise has helped DRLC grow over the past six years.



David Butler

David Butler BSc, MIFE, MIFSM, MIFPO, is the lead Fire Safety auditor for DRLC, and a well-respected consultant within the fire safety industry. He has gained extensive experience of the healthcare sector during the past 15 years as the Fire Safety manager for Sheffield Teaching Hospitals.

He has been involved in the fire industry for over 46 years as an operational firefighter at Sheffield Fire & Safety, progressing to the rank of Divisional Officer, and head of Fire Safety Policy and Development in 1999. Much of his fire service career has involved fire safety implementation measures and enforcing fire safety legislation. His comprehensive experience includes working on a wide variety of building types and occupancies, and he has a proven record in fire safe design review and the development, dissemination, and implementation, of organisational fire safety policy.

David is a Member of the Institution of Fire Engineers, the Institution of Fire Safety Managers, and the Institution of Fire Prevention Managers. He also holds a BSc in Fire Service Studies, and has attended many courses at the Fire Service College up to the level of Divisional Command, including the Specialist Fire Prevention course. Most recently, David completed the CO7 FPA Advanced Fire Risk Assessment course organised by NAHFO. His recent audit experience includes such work at a number of NHS Trusts countrywide.



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