

NHSScotland 'Firecode'

Scottish Health Technical Memorandum 81

Part 1: Fire precautions in new healthcare premises

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Disclaimer

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About this publication

This Scottish Health Technical Memorandum (SHTM) provides guidance on the design of fire precautions for new hospitals and patient care facilities or major extensions/refurbishments to existing hospitals and patient care facilities in Scotland. It supersedes previous guidance contained in Version 3 published in April 2003.

SHTM 81 recognises the special requirements for fire precautions in the design of new hospitals and other patient care facilities, or major extensions/refurbishments to existing hospitals and other patient care facilities. It recognises the interaction between physical fire precautions, the dependency of the patient, the fire hazards within healthcare premises, management policies and procedures, and the availability of adequately trained staff in achieving an acceptable level of fire safety.

This revision of SHTM 81 incorporates significant updates of the guidance and additional guidance on fire safety engineering and fire strategy. The revision was undertaken by Health Facilities Scotland and is published following wide consultation with NHSScotland stakeholders and other agencies with a professional interest in NHSScotland fire safety.

Revisions

This review aligns SHTM 81, Part 1 'Fire precautions in new healthcare premises', with the 'Non-domestic technical handbook' for compliance with the Building (Scotland) Regulations 2004, and replaces SHTM 81: 'Fire precautions in new healthcare premises', Version 3. For ease of use the short title 'Non-domestic technical handbook' is used throughout this document when referring to the technical handbook; Non-domestic, for compliance with Building (Scotland) Regulations 2004, and the term Non-domestic technical handbook should therefore be construed in that context.

SHTM 81 Part 2; Version 1 'Fire engineering in healthcare premises', introduces for the first time in NHSScotland Firecode, guidance for design teams and other relevant professionals on the application of fire safety engineering principles to NHSScotland healthcare premises.

1. Introduction and scope

General application

- 1.1 This Scottish Health Technical Memorandum (SHTM) provides recommendations and guidance, additional to the statutory requirements of the Building (Scotland) Regulations 2004, as amended. In doing so, it recognises the need for a higher standard of fire safety for the protection of patients from fire in the in-patient care areas of hospitals, and other treatment facilities. The guidance in this document is supplementary to, and must be read in conjunction with, the 'Non-domestic technical handbook'.

SHTM 81 recognises that whilst the incidence of fire in hospitals is low compared to that in other occupancy types, the consequences of fire in a hospital may be especially serious because of the difficulties and dangers associated with the emergency evacuation of patients, some of who may be highly dependent on life support equipment and staff assistance etc.

- 1.2 The guidance and recommendations in this document is consistent with the statutory compliance requirements of the Fire (Scotland) Act 2005 as amended and the Fire Safety (Scotland) Regulations 2006. However, it must be noted that compliance with this guidance and the 'Non-domestic technical handbook' should not be taken to suggest that the provisions of the legislation are met, as the compliance obligations are specific to the building being considered and the person/s responsible for ensuring fire risk assessment/s are conducted, the findings acted upon and that other fire safety management obligations are properly administered in accordance with the requirements of the Act and Regulations. Following completion and the subsequent occupation of newly built or refurbished healthcare premises the primary fire safety standards to be applied are those contained in;

- The 'Practical fire safety guidance for healthcare premises';
- SHTM 85: Fire precautions in existing healthcare premises;
- SHTM 83: General fire precautions;
- SHTM 86: Parts 1; Fire risk assessment in community healthcare premises, or;
- SHTM 86: Part 2; Fire risk assessment in healthcare premises;
- other NHSScotland Firecode documents where applicable to the circumstances being considered.

- 1.3 The management procedures and technical guidance described in this document should be a core component of the procurement and design process for new healthcare premises and major extensions/refurbishments, to ensure adequate provision for fire containment, detection and extinguishing, fire prevention measures, means of escape for patients/visitors, staff and

contractors and measures to assist the Fire and Rescue Service in the event of fire.

- 1.4 It is the responsibility of the Health Board Chief Executive to ensure that the managerial, procurement and technical provisions for fire safety in new hospitals meet or exceed the standards specified in this document.
- 1.5 'NHSScotland Firecode' SHTM 81 should be used in the design and procurement of:
- new hospitals, major extensions/refurbishments or changes of use to hospitals, regardless of the ownership or leasing arrangements of the premises or associated estate;
 - those parts of existing hospitals which are used as means of escape from any extension to a hospital.

Guidance on fire safety in existing hospitals may be found in;

- 'Practical fire safety guidance for healthcare premises' (Scottish Government);
 - SHTM 85: 'Fire precautions in existing healthcare premises';
 - SHTM 86: version 4, 'Fire risk assessment in existing healthcare premises' Version 4 Parts 1 or 2 as appropriate;
 - other parts of 'NHSScotland Firecode' as applicable.
- 1.6 The guidance in this document applies to all work requiring a building warrant. However, an alternative fire safety proposal may be made to meet the compliance requirements of the building regulations, as detailed in 2.0.6 of the 'Non-domestic technical handbook'. Where such an approach is adopted, it may also be acceptable to meet the mandatory compliance requirements of the Fire Policy for NHSScotland 2008; CEL 25(2008) and the fire safety objectives of this document. Alternative fire safety solutions should be considered in the context of the statutory compliance requirements that will apply under the terms of the Fire (Scotland) Act 2005 as amended and the Fire Safety (Scotland) Regulations 2006. The reasons for the decision to adopt an alternative fire safety solution should be fully documented and the decision confirmed by the Health Board Chief Executive.
- 1.7 Where an alternative fire safety engineering solution is proposed, particular attention is drawn to [paragraphs 1.8 to 1.10](#). [Paragraphs 1.19 and 1.20](#) also provide further guidance where it is proposed to adopt or consider a fire safety engineering solution.

Note: The local Fire Safety Advisor should be a member of the design team. Where the design team is not internally appointed, the Fire Safety Advisor should be a fully consulted party, representing the interests and fire safety obligations of the Health Board from the earliest stage of the design process. Their purpose is to ensure the fire safety design standards are consistent with the mandatory requirements of the Fire Policy for NHSScotland 2008; CEL 25(2008); the operational fire safety policy of the Board and the compliance requirements of the Fire (Scotland) Act 2005 and the Fire Safety (Scotland) Regulations 2006, and the Fire Policy for NHSScotland 2008; CEL 25(2008).

Relationship with building regulations - Procurement Procedures

- 1.8 The term ‘healthcare premises’ is used in SHTM 81, version 4, to allow the broad spectrum of premises used to treat NHSScotland patients to be fully taken into account. However, where appropriate, the term ‘hospital’ is used to identify specific requirements and recommendations for that occupancy. In any case, the ‘Non-domestic technical handbook’ specifies, amongst other things, the minimum requirements for the provision of structural fire protection, means of escape and fire fighting facilities in regard to both hospitals and other healthcare premises.

The requirements of the ‘Non-domestic technical handbook’ must be achieved, subject to any regulatory relaxations (Note 2) in accordance with the procedures set out in Section 4 of the Scottish Building Standards Procedural Handbook that have been granted. SHTM 81 should also be met, with ‘waivers’ (Note 1) formally agreed and signed off by the Health Board Chief Executive, as necessary.

Note 1: A ‘waiver’ is an agreed deviation from the standards contained in this document, subject to the procedures set out in [paragraphs 1.8, 1.9 and 1.10](#).

Note 2: The procedure for Scottish Ministers to provide a ‘direction’ in regard to an application for ‘dispensing’ or ‘relaxing’ a provision of the Building Regulations is clearly set out in (4.3) the ‘Scottish Building Standards Procedural Handbook’. The Handbook states; *“A relaxation or dispensation is for cases where a requirement is clearly, in whole or in part, unreasonable for a particular building.”*

- 1.9 The procedures set out below, should be followed for all projects to which this guidance is applicable. These are additional to, and distinct from, the procedures that should be followed to satisfy the statutory requirements of the Buildings (Scotland) Regulations 2004 and the associated Building Standards contained in the ‘Non-domestic technical handbook’.
- a) Regardless of the procurement route adopted for new or refurbished buildings e.g. Frameworks Scotland, private or public/private finance

initiative or other approved method, the Health Board Chief Executive should ensure that the Principal Supply Chain Partner and/or prospective suppliers or providers of healthcare premises for NHSScotland will be supplied with the current version of NHSScotland 'Firecode', and receive written confirmation of its receipt from all the parties to whom it is provided;

- b) The Health Board Chief Executive should ensure that the project brief, performance specifications, design standards etc. produced by the Board for the healthcare premises being built, extended or refurbished will contractually include a requirement to adopt the guidance set out in NHSScotland 'Firecode', and SHTM 81 in particular. SHTM 81 will be the minimum standard to be achieved unless waivers have been agreed as described below. Where it is proposed to adopt an alternative method of compliance the principle of equivalency should be applied to any fire safety proposals i.e. any proposal should at least meet, or surpass, the minimum fire safety performance standards contained in SHTM 81 and the 'Non-domestic technical handbook'. If it is proposed to adopt a fire safety engineering or other alternative approach, the decision to do so should be clearly identified in the project brief and approved by the Health Board Chief Executive. (See also [paragraph 1.19](#));

The Principal Supply Chain Partner, Design Team, Service Provider, or others affected by this section, should be informed of the above requirements and procedures during the briefing/tendering stage. An early undertaking by all Providers in this respect is essential and the proposals for the design of the new premises should incorporate the procedures and requirements in SHTM 81, including the 'relaxation' or 'waiver' procedures described in c) below;

- c) The design team, in-house or service provider will prepare preliminary designs and specifications, conforming to the requirements of the 'Non-domestic technical handbook', taking into account also the additional requirements of the NHSScotland Firecode guidance suite;
- d) The Health Board Chief Executive will thereafter appoint an in-house or independent third party body to assess whether or not the relevant standards specified in Firecode, including SHTM 81, have been met. There will be a formal 'signing off' process by the Health Board Chief Executive recording 'waivers' to SHTM 81, if any, the fire safety strategy and evacuation management plan, including the minimum number of staff required in patient access areas (see [Section 3, paragraph 3.16](#)).

Note: The role of the in-house or independent third party body is not to design the project, or direct the process. There should be no discussion between the in-house or independent third party body and the design team, as a robust design process should ensure that the documentation is complete and provides all the information required. However, following examination of the proposals, the in-house or independent third party body should clearly explain the grounds for deciding that a design proposal, either in part or fully, does not meet the required standard, in order to inform further development or revisions of the design.

- 1.10 If considered necessary by the Health Board Chief Executive, the in-house or independent third party body may consult NHS National Services Scotland (NSS) Health Facilities Scotland's Fire Safety Advisory Group for advice on any aspect of Firecode, including proposed 'waivers'. The Fire Group will formally advise the Health Board Chief Executive as to their opinion on the matter/s in question. Thereafter the Health Board Chief Executive will instruct the design team or service provider accordingly under the terms of the procurement contracts in place.
- 1.11 Once this process is complete, the design and specifications may be submitted for Building Control approval, including a written summary of the above process. Throughout the design process, the Health Board Chief Executive should be mindful of the need for statutory fire safety risk assessments and the additional compliance requirements of the Fire (Scotland) Act 2005 as amended, and the Fire Safety (Scotland) Regulations 2006, that will apply to the Health Board once they occupy or take control of the building.

Scope of SHTM 81

- 1.12 The main purpose of SHTM 81 Parts 1 and 2, Version 4, is to provide guidance on the standards of fire safety required in new hospitals and other healthcare premises or where major extensions/refurbishments or changes of use are being considered, taking into account the considerations detailed in the remainder of this section.
- [Section 3](#) provides recommendations on designing for progressive horizontal evacuation, and planning departmental and space relationships to minimise the potential for fires in non-patient access areas to affect patient access areas;
 - [Section 4](#) provides recommendations on detection and alarm systems for healthcare premises;
 - [Section 5](#) provides recommendations on means of escape provisions;
 - [Section 6](#) provides recommendations on structural fire precautions for the containment of fire and smoke.
 - SHTM 81 Part 2, Version 1, provides recommendations and guidance where it is proposed to adopt a fire engineering solution in regard to the fire safety, containment and escape provisions of the building being considered.
- 1.13 It is expected that NHSScotland procurement and building professionals, designers, Building Control and Fire Authorities, will exercise a degree of judgement based on a full understanding of all the circumstances, taking into account the factors listed below and the requirement to ensure high levels of provision when considering fire safety design solutions for NHSScotland healthcare premises. Relevant factors to be considered include:
- the dependency of the patient;
 - fire hazards within the premises;

- management policies, including the availability of sufficient and adequately trained staff;
- statutes and mandates including;
 - Fire (Scotland) Act 2005, as amended;
 - Fire Safety (Scotland) Regulations 2006;
 - Scottish Government Health Directorates; CEL 25 (2008), Fire Safety Policy for NHSScotland 2008;
- the fire safety strategy to be adopted for the project under consideration.

- 1.14 The complex nature of hospital use will often require a flexible design approach to ensure that the correct balance is achieved between the need for a high standard of fire safety and the core design requirements for the treatment and care of patients. These design requirements are not mutually exclusive and both must be accommodated in the design solution. In no circumstances should the safety of patients, staff, visitors, employees and contractors be compromised by the adoption of a lesser standard than specified in this document.
- 1.15 The principle of escape design for hospitals is that in an emergency, patients should be able to move, or be moved, to a place of relative safety on the same level, with assistance in the first instance from staff, from which further escape to a place of safety is possible. This principle is termed 'progressive horizontal evacuation' and is dependent on there being available at all times, amongst other things, sufficient structural fire compartments on each floor of the building. (see also [paragraph 3.3, Progressive horizontal evacuation](#))
- 1.16 In healthcare premises other than hospitals, progressive horizontal evacuation may not be necessary, and the standards that are applied in these cases should be those contained in the 'Non-domestic technical handbook', appropriate for the particular occupancy use of the premises.
- 1.17 Mattress evacuation must not be considered as a first option for escape design, but escape routes should be designed to permit mattress evacuation should it become necessary. The guidance and standards specified in this document assume that escape design follows these principles. Escape route widths and the width of escape stairs serving patient sleeping accommodation, including the specification for stairway landings, are contained in the 'Non-domestic technical handbook' Annex B; 2.B.3.
- 1.18 The design of means of escape from hospitals must not place reliance on, nor assume that evacuation will be undertaken by, or is the responsibility of, the Fire and Rescue Service. Evacuation is the explicit responsibility of the occupiers of the premises who must put in place management arrangements and procedures, including the provision of sufficient properly trained staff at all times, to facilitate the evacuation of all occupants in the event of a fire emergency. See also Scottish Government Health Directorates Fire Safety Policy for NHSScotland; CEL 25 (2008); Annex B. Mandatory Requirements (1) and (3).

As a fire situation develops and the remaining safe egress time for escape reduces, the Fire and Rescue Service may assist in patient evacuation to the extent they consider necessary; or in the most extreme circumstances, where assisted evacuation by staff is no longer viable, undertake rescues from fire.

- 1.19 The design of the means of escape from in-patient facilities must place no reliance on manipulative devices such as escape chutes or portable ladders. Escape should be accommodated by structural means, with the exception of escape bed lifts conforming with the Scottish Fire Practice Note (SFPN) 3 that may be installed to supplement the structural means provided.
- 1.20 This document describes one way of achieving an acceptable standard of fire safety within new hospitals but it is recognised that there may be other ways of achieving an equivalent standard by adopting a fire safety engineering approach. Fire safety engineering is based on a holistic understanding and consideration of fire safety needs, and provides a package of individual fire safety measures that are interdependent and work collectively to provide an appropriate fire safety design solution specific to the building being considered. The relationship between the individual components of the fire safety design solution is therefore critical to the operational performance of the adopted system. Approval for the adoption of such an approach should be obtained from the Health Board Chief Executive as set out in the procedures in [paragraph 1.8](#). If an alternative approach is used, responsibility is placed on the designer/s to provide sufficient documentary evidence to demonstrate that the proposed design provides at least an equivalent level of fire safety to that contained in the 'Non-domestic technical handbook' and NHSScotland Firecode.

Note: The acceptance in SHTM 81 that an alternative method of complying with the requirement to provide an appropriate fire safety standard for the building in question, is consistent with the Building (Scotland) Regulations 2004 compliance regime, identified in paragraph 2.0.6 of the 'Non-domestic technical handbook', headed 'Alternative approaches'.

- 1.21 NHSScotland Firecode SHTM 81 Part 2: 'Fire engineering in healthcare premises' provides further guidance and information where fire safety engineering is the adopted method of achieving an appropriate standard of fire safety for the building.
- 1.22 Any new building that does not provide departments or areas to which patients have access and is:
- detached from the main hospitals; or
 - joined to the main hospitals by a link corridor which contains no accommodation and does not form part of the escape route from the hospitals.

This should be designed in accordance with the requirements for that type of occupancy contained in the 'Non-domestic technical handbook', together with other applicable standards and guidance.

Use by competent persons

- 1.23 The guidance in this document has been prepared on the understanding that it will be used by 'competent' persons.

For the purposes of this document, persons will be considered competent where they have sufficient technical training and actual experience, or technical and other qualities, both to understand fully the dangers involved and to undertake properly the measures referred to in this document.

Consultation

- 1.24 Due to the complex and changing nature of hospitals and the often-conflicting requirements between fire safety and nursing care, including staffing levels, it is essential that consultation takes place at the design briefing stage between the Design Team, the Health Board Fire Safety Advisor and relevant enforcing authorities. Depending on the nature of the scheme it may also be appropriate to involve the client's insurers in the consultation process or take cognisance of CNORIS.

Fire safety during building operations

- 1.25 A significant number of fires occur as a result of construction activity. The site activities of contractors should be supervised and controlled. If the worksite is within the curtilage of an existing occupied hospital, any fire incident has the potential to impact significantly on the occupied part of the hospital.
- 1.26 The Fire (Scotland) Act 2005 (Relevant Premises) Regulations 2005; SSI 2005 No 352; modified S78 (2) of the Fire (Scotland) Act 2005. The effect of this modification was to define 'construction sites' as 'relevant premises' for the purposes of Part 3 of the 2005 Act. An obligation therefore exists, where a construction site jointly shares part of a site with an operational healthcare facility, for the occupiers of the respective parts to co-operate in the fire safety interests of persons in both parts of the estate.
- 1.27 In such cases, the Health Board should ensure that adequate precautions against fire are in place and that the Fire Safety Advisor maintains regular contact with contractors to ensure that their activities do not incur or introduce unacceptable fire risk to the premises, especially where the construction site is close to any patient access area of a hospital, and that the local fire safety policy and procedures, or other agreed procedures, are being complied with.
- 1.28 Similarly, the Health Board must ensure that appropriate facilities are afforded to the occupiers of the construction site to ensure that the activities in the healthcare premises do not present a fire hazard for those employed in the construction site e.g. obstruction of their escape routes, failure to provide a warning of fire in the adjacent healthcare premises.

1.29 Further comprehensive guidance on fire safety on construction sites is provided in:

- The Construction (Design and Management) Regulations 2007;
- 'Managing Health and Safety in Construction' 2007. HSE books (ISBN 9780717662234.);
- 'Construction fire safety' HSE, Construction Information Sheet, 51 (CIS 51);
- 'Fire prevention on construction sites', a joint code of practice published by the Building Employers Confederation, the Loss Prevention Council, and the National Contractors Group; 6th edition (ISBN 9781902790336);
- 'Standard fire precautions for contractors engaged on Crown works' published by the Department of the Environment, HMSO (ISBN 0-11-75223-5).

Other NHSScotland Firecode guidance

1.30 The guidance in this document has been prepared on the understanding that hospitals and healthcare premises, when completed, will be managed in particular with the following guidance;

- The (Scottish Government) 'Practical fire safety guidance for healthcare premises', and;
- SHTM 85: Fire precautions in existing healthcare premises. and;
- SHTM 83: 'Fire safety in healthcare premises – General fire precautions';
- SHTM 86 Part 1: Fire risk assessment in community healthcare premises, or;
- SHTM 86 Part 2: Fire risk assessment in healthcare premises;
- The Scottish Government CEL 25 (2008) Fire Safety Policy for NHSScotland 2008.

1.31 Further relevant guidance, where applicable and appropriate, may also be found in the following NHSScotland Firecode documents:

- SHTM 82 Supplement A Version 1: Automatic fire control systems and voice;
- SHTM 83 Version 3: Fire Safety in healthcare premises – General fire;
- SHTM 84 Version 4: Fire safety in residential care premises;
- SHTM 86 Part 1 Version 4: Fire risk assessment in community healthcare;
- SHTM 86 Part 2 Version 4: Fire risk assessment in healthcare premises;
- SHTM 87 Version 4: Textiles and furniture;
- SHPN 3 Version 3: Escape bed lifts;
- SFPN 4 Version 3: Hospital main kitchens;

- SFPN 5 Version 3 : Commercial enterprises on hospital premises;
- SFPN 6 Version 3: The prevention and control of deliberate fire raising in NHS healthcare premises;
- SFPN 7 Version 2: Fire precautions in patient hotels;
- SFPN 10 Version 3: Laboratories on hospital premises;
- SFPN 11 Version 1: Reducing unwanted fire signals in healthcare premises.

Other legislation

1.32 Other relevant legislation includes:

- The Fire (Scotland) Act 2005 (as amended);
- The Fire Safety (Scotland) Regulations 2006;
- The Construction (Design and Management) Regulations 2007;
- The Management of Health and Safety at Work Regulations 1999;
- The Disability Discrimination Act 1995.

2. Glossary of terms

2.1

For the purposes of this document, the definition of terms provided in the ‘Non-domestic technical handbook’, Appendix A, to support compliance with the Building (Scotland) Regulations 2004, will be used. The following additional definitions also apply:

- **circulation space:** the communication routes within a department or management unit giving access to other parts of a hospital, and to all necessary fire escape exits;
- **fire hazard:** a set of conditions in the operation of a product or system with the potential for initiating a fire;
- **fire precautions:** measures which can be taken to reduce the likelihood of ignition occurring and/or to mitigate the consequences should ignition occur. Precautions are considered under five headings, each of which is defined below:
 - a. **prevention:** precautions to control potential ignition and fuel sources, to ensure that fires do not start; prevention also includes general fire precautions;
 - b. **communications/detection and alarm:** systems which inform the occupants and Fire and Rescue Service when a fire starts;
 - c. **means of escape:** enables the occupants of the building to escape to a place of safety away from the effects of the fire;
 - d. **containment:** physical arrangements which contain the fire to the smallest possible area, and control the threat to life safety and the extent of property damage;
 - e. **extinguishment:** systems which ensure that the fire can be controlled and/or extinguished quickly and with minimum disturbance to the function of the hospitals and damage to its premises.
- **fire resistance:** ability of an element of building construction, component or structure to fulfil, for a stated period of time, the required load-bearing capacity, fire integrity and/or thermal insulation, and/or other expected duty in a standard fire-resistance test;
- **fire strategy:** A number of planned and co-ordinated arrangements designed to reduce the risk of fire and to ensure the safety of people if there is a fire;
- **ignition sources:** heat sources or flames which may cause ignition;
- **‘Non-domestic technical handbook’:** Guidance on achieving the standards required by virtue of the Building (Scotland) Regulations 2004 in regard to buildings being, or proposed to be, used for non-domestic purposes;
- **place of safety:** a place where persons are in no danger from fire;

- **progressive horizontal evacuation:** evacuation of patients away from a fire into a fire-free compartment or sub-compartment on the same level;
- **protected shaft:** a shaft which enables persons, air or objects to pass from one compartment to another, and which is enclosed with fire-resisting construction;
- **refuge:** a place of temporary safety within a building; this should be an adjoining compartment or sub-compartment capable of holding all those threatened, without a significant change in floor level and from which there is potential for further escape, should that become necessary;
- **SHTM/SFPN:** refers to the versions of these documents contained in NHSScotland Firecode Edition 4.

3. Principles of life safety

Introduction

- 3.1 In hospitals, particularly in patient access areas, the immediate and total evacuation of the building in the event of fire may not be possible or desirable. Patients whose mobility is restricted may not be able to negotiate escape routes, particularly stairways, without assistance. Patients whose ability to respond to an alarm of fire is limited by mental health, visual or aural impairments or those whose response may be affected by the influence of medication, and patients who are dependent on electrical/mechanical equipment for their survival cannot always be moved easily or quickly, and the act of doing so may itself incur some degree of potential for harm.
- 3.2 This document has been prepared on the assumption that there will be sufficient adequately trained staff on duty in a hospital at all times, to provide assistance with an evacuation in the event of fire (Scottish Government Health Directorates CEL 25 (2008); Fire safety policy for NHSScotland 2008).

In any case, the evacuation of an entire hospital may place patients at increased risk due to the physical and/or mental impact of the evacuation on their condition. Because of this, the evacuation of patients from hospitals should be based on the concept of progressive horizontal evacuation with only those patients directly at risk from the effects of fire and/or smoke being moved. It is the responsibility of the Health Board Chief Executive to ensure that an appropriate fire safety policy and management system is in place that:

- integrates static and dynamic fire safety provisions, and evacuation plans;
- is supported by adequate staff numbers, both day and night;
- is supported by a comprehensive system of fire safety training;
- is based on a system of fire risk assessment;
- is subject to a periodic and comprehensive fire safety audit.

Note: In the event of fire, non-patient visitors and those with no role to play in the evacuation of patients should evacuate the building to a place of safety, normally in the open air, but in any case in accordance with local procedures. The design of escape arrangements based on progressive horizontal evacuation relates only to the evacuation of patients. The design of escape arrangements must also make provision for persons other than patients who may also be in the building, in accordance with the standards specified in the 'Non-domestic technical handbook'.

Progressive horizontal evacuation

- 3.3 The principle of progressive horizontal evacuation is that of moving patients from an area affected by fire through a fire-resisting barrier to an adjoining area on the same level, designed to protect the occupants from the immediate dangers of fire and smoke. Patients may remain there until the fire is dealt with, or await further evacuation to another similar adjoining area or by way of the nearest escape stair or escape bed lift, to a place of safety. This procedure will give sufficient time for non ambulant and partially ambulant patients to be evacuated, by way of escape stairs or escape bed lifts, to a place of safety should it become necessary to evacuate an entire storey.
- 3.4 To maximise the time available for escape, minimise Fire and Rescue Service response time and to ensure that a warning of fire is provided to staff and occupants (other than in-patients) an automatic detection and alarm system must be installed throughout healthcare buildings. Refer also to [paragraph 4.6](#).

Requirements

- 3.5 Every storey containing patient access areas within hospitals must be designed to provide for progressive horizontal evacuation. See [Section 5](#) for additional guidance on progressive horizontal evacuation.
- 3.6 Patient areas, to which non-ambulant and partially ambulant patients have access, must not be located on storeys where evacuation in an emergency would necessitate travelling up an escape stair to a place of safety.

Separation of patient access areas from other parts of the hospital

- 3.7 In addition to the requirement for progressive horizontal evacuation, hospitals should be designed to minimise the possibility of fires in non-patient access areas affecting the patient access areas.
- 3.8 In this document, and in the 'Non-domestic technical handbook', the provisions required to minimise the possibility of fire spread between patient access areas and non-patient access areas are based on patient dependency and the potential hazard presented by the use, structure or contents (fire load) of the adjacent non-patient access area.
- 3.9 Patient dependency is categorised as follows:
- **normal dependency:** all patients except those classified as 'very high' dependency;
 - **very high dependency;** those whose clinical treatment and/or condition creates a high dependency on staff; for example, those in intensive therapy units, those who have a severe mental health illness, special care baby units and operating departments.

3.10 The hazard presented by non-patient access areas is categorised as follows:

- high hazard departments are departments or management units that contain high fire loads and/or significant ignition sources. Certain high hazard departments should not adjoin very high dependency patient access areas, either horizontally or vertically, and require, in addition to fire resistant structural separation, an automatic fire control system when adjacent to normal dependency patient access areas.

3.11 The departments in the following **List A** should:

- never be directly below, nor directly adjoin, operating theatres, intensive therapy units or special care baby units; and
- be provided with a fire suppression system where they are directly below, or directly adjoin, any other hospital department to which patients have access.

List A

- Boiler House
- Central Stores
- Commercial enterprises
- Flammable stores
- Laundry
- Main electrical switchgear
- Main kitchens
- Refuse collection and incineration
- Works department

Other high hazard departments may be adjacent to very high dependency patient access areas if an automatic fire control system is installed in addition to fire resistant structural separation.

A hospital department in **List B** should be provided with an automatic fire suppression system where it is directly below, or directly adjoins, operating theatres, intensive therapy units, or special care baby units.

List B

- Central staff change
- Central sterile supplies
- Hospital sterilizing and disinfecting unit
- Health records
- Pathology
- Manufacturing pharmacy

(‘Non-domestic technical handbook’; 2008; Section 2; Annex B; paragraph 2.B.1.)

The minimum provisions of the 'Non-domestic technical handbook', Annex 2.B.1, are required for any area in the building that has a comparable hazard to the areas in Lists A and B of Annex 2.B.1 in the 'Non-domestic technical handbook'.

- **normal hazard departments** are departments or management units that do not contain high fire loads and/or significant ignition sources. Normal hazard departments may adjoin patient access areas, either horizontally or vertically.

Requirements

- 3.12 The relative location of non-patient and patient access areas, the level of fire safety performance of separating walls and floors, and the provision of an automatic fire control system must comply with the requirements of the 'Non-domestic technical handbook'.

Main medical gas stores must comply with the requirements of SHTM 2022: 'Medical gas pipeline systems'.

- 3.13 'Places of Special Fire Risk', as defined in Annex A of the 'Non-domestic technical handbook', must comply with the additional requirements specified in the 'Non-domestic technical handbook', 2.1.8.

- 3.14 In addition to the specific requirements of the 'Non-domestic technical handbook', for fire safety precautions in commercial enterprises and atria in hospitals, further guidance is provided in:

SFPN 5: 'Commercial enterprises on hospital premises'; BRE and CIBSE design guides for smoke control systems.

Staffing levels

- 3.15 The provision of an adequate number of staff that have received appropriate fire safety training is a very significant component of the defence against fire. This is particularly important at night when levels of activity in the hospital are reduced. The presence of trained staff who can respond quickly and effectively to any fire emergency is a vital factor in limiting the consequences of a fire, particularly where dependent patients are involved.

- 3.16 The guidance in this document has been prepared on the understanding that adequate numbers of staff will be available at all times. It is the responsibility of the Chief Executive to ensure that suitable arrangements are put in place for the safe evacuation of all patients in accordance with an emergency evacuation plan that is subject to periodic review: (CEL 25 (2008) Fire safety policy for NHSScotland 2008; Annexe B, 1. Introduction). Guidance on the preparation of emergency plans is provided in SHTM 83: 'Fire safety in healthcare premises - General fire precautions'.

Requirement

- 3.17 The number of staff available at any time must be sufficient to facilitate an evacuation of the ward, department or managed unit in accordance with a pre-existing emergency plan. Staff must have received training in the methods of patient evacuation appropriate to the dependency of the patients in their care and be familiar with the evacuation procedure for their workplace. See also Scottish Government Health Directorates; CEL 25 (2008); Fire safety policy for NHSScotland 2008 Annexe B.

4. Communications

Principle

- 4.1 Provisions for the earliest possible automatic detection of fire, and means to automatically or manually raise an alarm of fire, including alerting the Fire and Rescue Service, must be an integral component of the fire safety design and construction of healthcare buildings. In larger healthcare premises it may be appropriate to have separate provisions for warning staff, patients and visitors in different parts of the building, consistent with the procedural and physical arrangements provided for the evacuation of patients. However, in some premises e.g. health centres, daycare facilities, clinics and similar small healthcare premises a simple one out, all out evacuation signal may be appropriate.
- 4.2 The operation of the warning system should be clearly documented in the fire safety strategy and evacuation management plan.
- 4.3 The provision of adequate means for detecting a fire and raising the alarm is of vital importance, and this is supplemented by staff observation. Early detection increases the available time to escape and allows the fire to be tackled at an early stage when the potential for successful extinguishment is maximised.

Observation

- 4.4 The early detection of fire by people is probably the best form of fire detection, and the design and layout of an area incorporating good staff observation can make a positive contribution to fire safety. Within a patient access area the number of beds visible from the staff base can make a significant contribution to fire safety in that area by ensuring that the likelihood of early fire detection, by observation, is maximised.
- 4.5 However, the value of good local observation of patient care areas may be limited by a number of factors;
- patient areas comprising individual patient rooms will limit the area that can be observed by staff;
 - patient areas comprising a number of four or six bed bays may similarly limit the area that can be observed from the staff base;

The occupational work patterns of ward staff usually indicate that constant occupation of the staff base should not be relied on as an indicator of good observation;

- observation in non-patient rooms and circulation spaces may be limited outside daytime hours and weekends, as many administrative, stores,

works, plant-room and other areas are unoccupied and locked for security purposes. Staff presence in such areas, may therefore be non-existent or at best very limited during these times, and the detection of fire is therefore dependent on a comprehensive and effective automatic fire detection system.

Detection and alarm systems

- 4.6 The provision of effective fire detection and alarm systems in hospitals is a vital component of the overall fire safety strategy to protect patients, staff, visitors, contractors etc and property from fire. SHTM 82: 'Alarm and detection systems', and any supplement thereto, provides general principles and technical guidance on the design, specification, installation, commissioning, testing and operations of fire alarm systems in hospitals. It should be read in conjunction with BS 5839: Part 1: the relevant parts of BS EN 54, and the criteria specified in the 'Non-domestic technical handbook', Annex 2.B; 2.B.5.
- 4.7 All voids containing pipes carrying medical gases, as defined in SHTM 2022: 'Medical Gas Pipeline Systems', or natural gas, require automatic fire detection, except where identified in the 'Non-domestic technical handbook', Annex 2.B; 2.B.5 i.e.
- in a void or roof space which contains only mineral insulated wiring, or wiring laid in metal trays, or in metal conduits, or metal/plastic piping used for water supply, drainage or ventilation ducting.
- 4.8 The selection and siting of detectors should take into account the operational requirements of the area and the impact of unwanted fire signals. In this context consideration should be given to an alternative to standard smoke and heat detectors e.g. multi-sensor detectors, as this type of detector has been shown to contribute significantly to the reduction of unwanted fire signals. Further guidance is contained in SFPN 11 'Reducing unwanted fire signals in healthcare premises'.
- 4.9 Voice alarm systems have been shown to provide significant benefits in terms of reduced response time and improved information dissemination, factors that are critical in a healthcare environment. Guidance on voice alarm systems is provided in SHTM 82, BS 9999: 2008 and BS 5839 Part 8.
- 4.10 Where a temporary waiting space is provided within, or immediately adjacent to, a protected stairway enclosure in accordance with the provisions of the 'Non-domestic technical handbook'; 2.9.25, in healthcare premises other than a hospital, to facilitate the safe evacuation of mobility impaired person/s, each such space should be provided with a suitable emergency voice communication system (EVC).
- 4.11 The objective of the communication system is to provide the means for persons with a mobility, or other, impairment at a temporary waiting space to communicate their presence to the person/s with responsibility for managing the evacuation. BS 9999; Annex G1, Recommendations for refuges and evacuation

lifts, states “*To facilitate the effective evacuation of people from refuges, an emergency voice communication (EVC) system should be provided. It is essential that the occupants of each refuge are able to alert other people that they are in need of assistance and for them to be reassured that this assistance will be forthcoming.*”

- 4.12 Careful consideration must be given to the location of the receiving base ('master station'; see BS 5839; Part 9) for communications from the waiting space/s, and the arrangements for using it, which should form part of the fire procedure arrangements for the building. It should in any case be in a location safe from the effects of the fire that initiated the alarm, and from which appropriate control of the evacuation may be exercised e.g. within a fire protected stairway enclosure adjacent to a final exit, adjacent to a fire alarm control panel or repeater panel, or in another safe location with immediate and direct link/s to the person with responsibility for managing the evacuation.
- 4.13 Emergency voice communication systems should be designed and installed in accordance with BS 5839; Part 9; 2003. Further guidance may also be referred to in BS 9999; 2008.

Note: A temporary waiting space is required by virtue of the 'Non-domestic technical handbook' to facilitate the evacuation of persons with a mobility impairment, except in hospitals where escape arrangements are based on progressive horizontal evacuation. 'Non-domestic technical handbook'; 2.9.25.

- 4.14 The design, selection of system components and the warning signals provided by fire alarm and detection systems should take into account the population profile for the building proposals being considered, in particular the needs of those building users who may have a sensory impairment. In any case, the system should operate in a way consistent with the needs of all those who may use the building and with the objectives of the fire strategy.

Requirements

- 4.15 An automatic fire detection and alarm system, incorporating manual means for raising an alarm of fire must be provided throughout all proposed healthcare buildings.
- 4.16 Where a temporary waiting space within or immediately adjacent to a protected escape stairway serves the upper floor/s of a healthcare building, other than a patient access area in a hospital, it must be provided with an emergency voice communication system (EVC).
- 4.17 The detection and alarm systems provided must comply with the guidance specified in:
- BS 5839; Part 1; 2002; and additionally
 - SHTM 82: 'Alarm and detection systems';
 - 'Non-domestic technical handbook', Annex 2.B; 2.B.5.

- 4.18 Emergency voice communication systems (EVCs) must comply with the guidance specified in:
- BS 5839; Part 9; 2003; and additionally
 - BS 9999; 2008.

5. Means of escape

Principle

- 5.1 The design and construction of hospitals should ensure that, at all times, patients can move, or be assisted to move, away from a fire to a place of temporary safety inside the building on the same level from where further escape is possible to a place of safety outside the building; and that suitable and appropriate arrangements are provided for the safe evacuation of all others in the building in accordance with the regulatory requirements and supporting guidance standards that currently apply.
- 5.2 The means of escape in hospitals must comply with the requirements of the 'Non-domestic technical handbook' and the additional guidance provided in this section. The requirements for means of escape are based on:
- the potential for horizontal evacuation, which is achieved by dividing the storey into compartments and sub-compartments;
 - height above ground level of the patient access area;
 - travel distance and escape routes;
 - the provision of an adequate number of exits and escape stairs;
 - the provision of emergency lighting and escape lighting.

Requirement

- 5.3 The provisions for means of escape in hospitals must comply with the requirements of the 'Non-domestic technical handbook', with particular reference to the relevant parts of section 2, Fire; and Annex 2B; Additional guidance for hospitals.

Compartmentation

- 5.4 The provision of compartments and sub-compartments to facilitate progressive horizontal evacuation should not be considered only in terms of means of escape and the containment of fire. The design, fire integrity, size and configuration of compartments and sub-compartments should also take into account user responsibilities, such as the extent of the area under management control, including the management of patient care, as well as the conduct of fire drills and the management of evacuation, etc.

Requirements

Compartments

- 5.5 Every compartment in a hospital should be limited to a maximum area of 1500m². In addition, every upper storey and every basement storey should form a separate compartment. ('Non-domestic technical handbook'; Annex 2.B.1)
- 5.6 Where occupants may need to be evacuated horizontally through a protected door into an adjoining compartment, each compartment should be capable of holding the occupant capacity of that compartment and the largest adjoining compartment.

Sub compartments

- 5.7 To assist in the safe horizontal evacuation of patients in a hospital, every compartment should be divided into at least 2 sub-compartments by a sub-compartment wall with short fire resistance duration, so that no sub-compartment is more than 750m². By providing a series of barriers it is intended that patients or residents will be able to remain in the building and avoid the need for complete evacuation. ('Non-domestic technical handbook'; Annex 2.B.1)

Note: In patient access areas, a *compartment* under the limited size (750m²) of a *sub-compartment* need not be further sub-divided as it is already under the maximum size for a sub-compartment except when the *compartment* is the *only* compartment on the floor in question, in which case it must be sub-compartmented by construction of short fire resistant duration, to ensure that horizontal escape is possible on that floor level.

Storeys at a height of more than 7.5m containing departments to which patients have access.

- 5.8 Such storeys should comprise at least 4 compartments, each of which should have an area of at least 500m² or have a hospital street and at least 3 other compartments each of which should have an area of at least 500m². ('Non-domestic technical handbook'; Annex 2.B.1)

Travel distance

- 5.9 Travel distance is measured along the actual escape route and must therefore take account of the location of equipment, items of furniture and other obstructions that will be present when the building is occupied.
- 5.10 Travel distance in a hospital should comply with the requirements of the 'Non-domestic technical handbook'; Annex 2.B.3; Escape.

Requirement

- 5.11 Where an escape route from a room is into an unprotected open plan zone and/or passes a waiting or sub-waiting area, or any escape route passes through or involves crossing a large open plan area, the escape route must be clearly defined by a fixed screen, partition or similar means. However, an exception to this requirement may be made in small open plan areas used by limited numbers of employees only; where the choice of exit routes is clearly visible and the area is not an escape route used by the general public.
- 5.12 Travel distance in a hospital should comply with the provisions specified in Annex 2.B.3 of the 'Non-domestic technical handbook'.

Hospital streets

- 5.13 In the design of hospitals, the concept of the hospital street is widely used to provide the main circulation route linking hospital departments, escape stairs and escape bed lifts, especially in larger hospital buildings to facilitate the quick and easy movement of patients and staff between departments. Although many hospitals are provided with hospital streets, they are not a requirement of the 'Non-domestic technical handbook' or this guidance, and in some smaller hospitals may not be considered necessary.

In smaller cottage hospitals or psychiatric units for instance, it may not be necessary as the horizontal escape requirements may be met without the need for a hospital street, and even in some larger hospitals depending on the layout, escape criteria may be met without the need for a hospital street e.g. in high buildings with a small footprint, incorporating a central core.

- 5.14 A hospital street is a protected zone that connects places of safety, escape stairs, escape bed lifts, fire-fighting shafts and compartment entrances. It has two primary fire safety functions;
- to provide the Fire and Rescue Service with a fire-fighting bridgehead in the event of fire; and
 - to facilitate the evacuation of patients and other occupants to parts of the hospital not affected by fire; in the event of fire spread within a compartment that cannot quickly be brought under control.
- 5.15 A hospital street should;
- have an unobstructed width of not less than 3m, and
 - comprise at least 3 sub-compartments, and
 - comprise at ground floor level at least 2 final exits, and
 - must not contain a shop or other commercial enterprise, and
 - if on an upper storey, provide access to at least 2 escape stairs accessed from separate sub compartments located so that:

- the distance between escape stairs is not more than 64m; and
- the distance of single direction travel within the hospital street is not more than 15m; and
- the distance from a compartment exit to an escape stair is not more than 32m.

5.16 Hospital streets should in any case comply with the specific provisions contained in Annex 2.B.3 of the 'Non-domestic technical handbook'.

Vertical escape

5.17 The minimum provisions for vertical escape are contained in the 'Non-domestic technical handbook'.

5.18 Mattress evacuation is inherently hazardous and should not be considered as the primary or normal means for evacuating patients via stairways in an emergency. However, it must also be recognised that in a significant fire emergency a potential for mattress evacuation exists. The 'Non-domestic technical handbook', Annex 2.B.3 specifies the minimum width of stairways and landings serving patient sleeping accommodation, taking into account the potential for mattress evacuation.

5.19 Where vertical travel is a component of the escape arrangements and bed lifts are installed in the building, they should be escape bed lifts. In premises where escape bed lifts are provided:

- they must provide sufficient capacity to evacuate the storey in the event of fire in any compartment on the storey;
- escape bed lifts must comply with the design considerations of SHTM 2024: 'Lifts'.
- escape bed lifts must comply with the general technical guidance provided in SFPN 3: 'Escape bed lifts'.
- the management, and operational arrangements specified in SFPN 3: 'Escape bed lifts' must be implemented to ensure that the lift can be safely used in an emergency and that sufficient staff trained in its use are available at all times it may be required.

External stairways

5.20 Unenclosed external stairways must not be provided for escape purposes from patient access areas.

Protected lobbies

- 5.21 Protected lobbies should not normally be located so that they form part of a through route, i.e. they should not be located across a corridor if the corridor continues beyond the protected lobby.

Car Parks

- 5.22 Access from any car park to a hospital must be via a protected lobby. Where access is provided directly from the car park to the hospital, vertical access within the car park should be via a stairway/s provided with protected lobbies serving the car park floors providing access to only one storey of the hospital building.

Final exits

- 5.23 Generally within hospitals many of the final exits will also be used for normal access to the hospitals and will be designed to permit access for people with restricted mobility. However, exits provided only for escape purposes must also be designed to take cognisance of the Disability Discrimination Act (1995) and the need to accommodate the egress requirements of persons with a disability.
- 5.24 The design of all exits should recognise the conflicting requirements for means of escape and security of hospitals. It is not possible to provide definitive guidance, however any solution should be agreed between the enforcing authorities, the Health Board management team and its security advisors. In no case should security arrangements inhibit or prevent safe escape from the building, or to an adjacent compartment or exit route within the building that may at any time be required for escape purposes.

Requirement

- 5.25 Final exit doors from escape stairs that are not part of a horizontal escape route should not be provided with a step and should open on to an area which is level for a distance of at least 1m. Final exit doors on a horizontal escape route must be provided with a ramp. In addition, the requirements of the Disability Discrimination Act (1995) apply.

External routes and assembly positions

- 5.26 Should it become necessary to evacuate an entire hospital or part of a hospital, adequate and appropriate external assembly locations should be identified. Suitable locations may include roadways, hard standings or suitably designed parts of the landscaping not forming part of a designated fire appliance access route.

The locations to be used should be carefully selected to ensure that persons are not endangered by traffic or other hazards. Such places may include hard

standings, landscaped areas, pavements or roadways only where they can be controlled and supervised e.g. a small cul-de-sac with no through traffic in hospital grounds that can be easily closed when necessary. So far as possible the place/s selected as assembly areas should be a sufficient distance from the affected building so that persons are not endangered by arriving fire service vehicles, subsequent fire fighting activities or the effects of fire.

- 5.27 The evacuation management plan should include arrangements for the subsequent movement of evacuated patients to suitable temporary accommodation, taking into account their continuing healthcare needs.

Requirement

- 5.28 The following points must be considered when designing external routes and assembly areas;
- the location of assembly positions to permit access for ambulances without compromising Fire and Rescue service access;
 - the provision of adequate artificial lighting;
 - the provision of adequate paved footpaths and dropped kerbs to the assembly points;
 - the gradients of external routes;
 - the proximity of external routes to external walls with openings of the hospital;
 - patient dependency, both physical, sensory impairment and mental health;
 - the physical and sensory impairment of staff.
 - the segregation and safety of evacuated persons from traffic and hazards associated with the incident.

Emergency and escape lighting

- 5.29 For hospitals, the general guidance on emergency lighting contained in BS 5266 – 1; BS EN 1838/BS 5266 – 7; BS EN 50172/BS5266 – 8; BS 5266 -10 is supplemented by SHTM 2007 ‘Electrical Services – supply and distribution’, SHTM 2011: ‘Emergency electrical services’ and the CIBSE guide ‘Lighting guide LG2: hospitals and healthcare buildings’ which provides additional guidance on hospital emergency lighting and details of the electrical supply required.
- 5.30 The minimum requirements for emergency lighting in healthcare buildings are specified in the ‘Non-domestic technical handbook’, section 2; (2.10) and annex 2.B. (2.B.4).

Background

- 5.31 An operational healthcare imperative exists to provide emergency lighting in hospitals, in addition to fire safety considerations. The guidance referred to in [paragraph 5.29](#) provides extensive guidance on the design of emergency electrical services for hospitals. The guidance in this document has been prepared on the understanding that in most departments of a hospital, the emergency lighting system/s provided to support the operational needs of the hospital will also provide adequate escape lighting. However, minimum standards of provision for healthcare premises are specified and referred to in this section to ensure that adequate lighting is provided to facilitate the evacuation of patients and others in any circumstances.
- 5.32 To enable essential hospital services to be maintained, most hospitals are provided with standby generators that operate when there is a failure of mains electricity. These are designed to provide an emergency electrical supply within 15 seconds of a mains failure. In those areas of the hospital where 15 seconds response time is unacceptable for health and safety reasons (for example operating theatres and stairways), battery back-up, with a typical response time within 0.5 seconds, is provided.
- 5.33 Electrical distribution in hospitals is generally provided by essential and non-essential electrical circuits. These are normally segregated; however where this is not possible, essential services cables must be wired in fire-resistant cable.
- 5.34 The luminaries connected to the essential circuits are designed to provide between 30 and 50 per cent of the normal lighting level in the event of failure of the mains supply.
- 5.35 In addition to the above, within each hospital department, separate circuits are provided for circulation spaces. Therefore, failure of a lighting circuit supplying a circulation space will not affect the lighting circuits in the adjacent rooms and vice-versa. Generally hospital streets are also supplied with independent essential and non-essential circuits. This large number of electrical circuits should ensure that when one lighting circuit fails, as a result of fire, the other circuits would still provide acceptable levels of escape lighting.

Requirements

- 5.36 Emergency electrical services should be designed to comply with the requirements of SHTM 2007: 'Electrical services: supply and distribution' and SHTM 2011: 'Emergency electrical services'.
- 5.37 Any part of an escape route from a room to a final exit or adjacent compartment should have at least one lighting circuit supplied from the essential circuit system.
- 5.38 In the event of a failure of mains supply the essential lighting circuits should be designed to provide between 30 and 50 per cent of the normal lighting level.

- 5.39 The distribution boards for the essential and non-essential circuits may be in the same location but should be in separate metal cabinets.
- 5.40 In those areas where 15 seconds response time would be considered hazardous (for example stairways), emergency lighting should be provided by battery back-up giving a typical response time within 0.5 seconds and a minimum duration time of three hours.
- 5.41 In those areas of hospitals which are not provided with essential and non-essential circuits as required by SHTM 2007 and SHTM 2011, escape lighting should be provided in accordance with BS5266 - 1 with a minimum duration time of three hours in the following areas:
- a corridor or protected zone;
 - a room with an occupancy capacity of more than 10 people;
 - a public area, corridor or protected zone servicing an underground car park where less than 30 per cent of the perimeter of the car park is open to the external air;
 - a basement storey and any corridor or protected zone serving such a storey;
 - a place of special fire risk (other than one requiring access only for the purposes of maintenance) and any corridor or protected zone serving it.
- 5.42 In any case, escape route lighting should be provided in accordance with the requirements contained in 2.10 and Annex 2B of the 'Non-domestic technical handbook'.

6. Containment of fire and smoke

Principle

- 6.1 The design and construction of the hospital shall:
- provide sufficient resistance to the effects of fire to maintain its structural stability and provide adequate time for escape and extinguishment;
 - inhibit the spread of fire and smoke within the building;
 - inhibit the external spread of fire to upper storeys in the building;
 - inhibit the spread of fire to adjacent buildings.

Requirements

- 6.2 The provisions for structural stability, the spread of fire and the products of fire via concealed spaces and cavities, and the containment of fire and smoke in hospitals must comply with the requirements of the 'Non-domestic technical handbook', Part 2.0, including Annex 2.B.

Fire safety performance of ceilings

- 6.3 A fire-resisting ceiling, including a suspended ceiling, may contribute to the fire resistance of a compartment floor only in accordance with the conditions contained in 2.1.16 of the 'Non-domestic technical handbook', in particular;
- the ceiling shall not be easily demountable: and
 - any openings for service penetrations shall be appropriately fire stopped to maintain the fire resistance duration and integrity of the ceiling;
 - if an access hatch is fitted it shall provide the same fire resistance duration as the ceiling in which it is situated.

Sub-compartmentation in Intensive Treatment Areas e.g. ITU & HDU etc.

- 6.4 Intensive treatment areas must be divided into two sub-compartments, to separate the 'nursing area' from the 'utility area'. 'Non-domestic technical handbook' 2.B.1
- 6.5 Every entrance to an intensive therapy unit should be from a hospital street or; through a lobby having short fire resistance duration. 'Non-domestic technical handbook' 2.B.1

Transfer grilles

- 6.6 To reduce the possibility of smoke transfer between compartments and sub-compartments, the installation of transfer grilles in fire resisting door sets in compartment and sub-compartment walls should be avoided. Where, however, they are an essential component of the air transfer system they must be provided with remotely resettable fire and smoke shutters operated by the fire detection and alarm system. Fire doors, including frame and hardware, should be tested by an accredited testing centre in accordance with BS 476 Part 22 or BS EN 1634-1: 2000. Appropriate documentary evidence as to the fire performance of the door set, including transfer grilles, relating to the assembly as tested, should be provided.

Ventilation ductwork

- 6.7 Ventilation ductwork must comply with the requirements of BS 9999: 33.4 and SHTM 2025: 'Ventilation in healthcare premises'.
- 6.8 Ductwork passing through a compartment or sub-compartment boundary must be provided with remotely resettable fire and smoke dampers operated by smoke detection.
- 6.10 Ductwork passing through cavity barriers must be provided with remotely resettable fire and smoke dampers operated by smoke detection unless the design and construction of the ductwork in the adjacent spaces on each side of the cavity barrier provides the same minimum level of fire safety performance as the cavity barrier.
- 6.11 Pneumatic air tube transport systems must comply with the requirements of SHTM 2009: 'Pneumatic air tube transport systems'. In particular care must be taken to ensure that the tube network is adequately fire stopped at those points where it passes through compartment or sub compartment walls or other elements of structure having a specified degree of fire safety performance. See 'Non-domestic technical handbook', 2.1.14.

Fire doors

- 6.12 Fire doors must have a specified fire safety performance, determined by testing conducted in accordance with BS 476-22. The fire safety performance duration of doors required for particular applications is that specified in the 'Non-domestic technical handbook'. 2.0, fire.
- 6.13 With the exception of fire doors that are kept locked shut, fire doors must be fitted with an automatic self-closing device conforming with BS EN 1154 or BS EN 1634-1.
- 6.14 Each door fitted with an automatic door release must be closed at a predetermined time each night and remain closed throughout sleeping hours. If for reasons of patient healthcare management this is undesirable, it must be the

specific responsibility of a member of staff to operate the release mechanism at least once a week to ensure that:

- the mechanism is working effectively;
- the doors close effectively onto their frames;
- Door release mechanisms should comply with BS 5839: part 3. The fail-safe operation of the door release mechanism should occur under the conditions specified for Category 'A' in BS 7273: part 4.

Note: Automatic door release mechanisms should activate when weekly fire alarm tests are conducted. The effective closing of the door may be observed at that time and the results recorded, or where necessary the action taken to rectify any defects identified.

- 6.15 All fire doors, including each leaf of double doors, must be provided with an identification disc. The disc must be a minimum of 45mm in diameter clearly indicating the level of fire safety performance of the door.
- 6.16 Powered automatic sliding doors activated by a motion sensor must comply with the requirements of BS 7036; 1996 and;
- fail safe to outward opening from any position of opening, or
 - have a monitored fail-safe system to open the door/s from any position in the event of mains power failure or failure of the movement sensor linked to the door operation; and
 - opens automatically from any position on the activation of the fire alarm system in the zone in which the door is situated.
- 6.17 Powered sliding doors that do not comply with this standard are not acceptable and should not be installed.
- 6.18 Door swings must not obstruct the designed width of the circulation space or escape route. However, doors to cupboards, etc. which are normally locked may open on to circulation routes but it is recommended that such doors should open through 180° to avoid obstruction.
- 6.19 Fire doors across escape routes providing alternative means of escape must be double swing and of glazed construction or have a glazed vision panel and those across escape routes providing single direction of escape must open in the direction of escape.
- 6.20 Fire doors across circulation routes must be fitted with glazed observation panels to assist wheelchair users.
- 6.21 Guidance on the installation and maintenance of fire doors with non-metallic leaves is provided in BS 8214.

External fire spread

- 6.22 The design and construction of the external walls of hospitals requires careful consideration to prevent the vertical or horizontal spread of fire between compartments; on, within or beyond the building envelope. In addition to the design and construction of the envelope, the potential for vertical or horizontal fire spread on, within or beyond the building envelope, is dependant on factors such as fire location, fire severity and, where proposed, the design of automatic fire control systems.

Requirement

- 6.23 The standards specified in the 'Non-domestic technical handbook'. Section 2.0, fire, subsections 2.6 to 2.8, relating to the fire resistance duration of external walls and the prevention of external fire spread should be complied with. Where an alternative compliance route is proposed such as a fire safety engineering proposal, and is approved and adopted, it shall take account of the potential for external fire spread and provide appropriate evidence to show that at least an equivalent standard to that specified in the 'Non-domestic technical handbook' has been achieved.

Additional requirements for the operation of heating, ventilation and air conditioning (HVAC) systems

Design of HVAC systems

- 6.24 Ventilation is used extensively in hospitals for primary patient treatment in operating departments, intensive therapy units and isolation suites. It is also installed to ensure compliance with quality assurance standards for manufactured items in pharmacy and sterile supply departments and to protect staff from harmful organisms and toxic substances, for example in laboratories. Guidance on the general design of ventilation systems is available in SHTM 2025: 'Ventilation in healthcare premises'.
- 6.25 In the event of a fire, large quantities of smoke and toxic gases may be given off which potentially could be transferred through the ductwork to rooms and areas remote from the fire. Therefore measures are required to:
- prevent fire from entering or leaving ductwork;
 - limit the spread of smoke and other products of combustion within ductwork;
 - prevent a breach in the integrity of a wall or floor with a specified level of fire safety performance where it is penetrated by ductwork.

Requirements

- 6.26 Ventilation systems must be designed and installed to comply with SHTM 2025: 'Ventilation in healthcare premises' and BS 9999, 2009; section 7, and the additional guidance in the following paragraphs.

- 6.27 Ventilation systems must not be common to both patient areas and hazard departments. Fresh air intakes should be positioned to avoid the possibility of the intake of smoke and toxic gases.

Operation of ventilation plant

- 6.28 The ventilation plant should not automatically shut down when the fire detection and alarm system operates. In the event of a fire the system should continue to operate and be provided with the facility for shut down and start up under the instruction of the Fire and Rescue Service. Fire and Rescue Service control should be possible from panels located either at department entrances or adjacent to the main fire alarm indicator panels.

Intensive treatment areas (ITA) e.g. ITU & HDU etc

- 6.29 The aim of any design should be to prevent a fire in an adjacent compartment either on the same storey or on a storey above or below requiring the evacuation of an intensive treatment unit. The HVAC systems should be designed so that an adequate period of time is provided to enable a fire to be detected and extinguished before it threatens the occupants.
- 6.30 The HVAC systems provided to intensive treatment areas are designed so that the pressure within the department is maintained at a level slightly above that of the adjacent areas. In a fire emergency, the continuing operation of these systems will assist in preventing smoke and other products of combustion entering the intensive treatment area.

Requirement

- 6.31 In intensive treatment areas and operating theatres, the HVAC systems must be designed so that they continue to operate in a fire emergency. The shut down of these systems should be on the instruction of the Fire and Rescue Service and must be controllable from remote panels located at either the department entrance or adjacent to the main fire alarm indicator panel.

7. Automatic fire control systems

- 7.1 An automatic fire control system that uses an extinguishing medium suitable for the particular application being considered, most commonly a water sprinkler system, is required in certain prescribed circumstances;
- where a fire safety engineering approach has been approved and adopted for the design of the building and it has been identified that in order to achieve an acceptable standard of fire safety performance for the structure and fire safety management of the building an automatic fire suppression system must be installed;
 - where the provision of a fire suppression system is identified as necessary in accordance with the requirements of the 'Non-domestic technical handbook'; Section 2, fire; Annex 2B, additional guidance for hospitals;
 - where it is necessary to reduce the probability of patient evacuation in the general circumstances described in SHTM 82: Supplement A; and in particular the specific circumstances identified in paragraph 3.4 of SHTM 82: Supplement A and supporting paragraphs.
- 7.2 The design of an appropriate fire control system, including a water sprinkler system, requires evaluation of the interaction of a number of factors including;
- the occupant dependency and density;
 - the fire hazards including the fire load density and distribution;
 - the management arrangements including the availability of sufficient adequately trained staff;
 - the strategic importance of the facilities being considered in regard to the ongoing provision of healthcare;
 - the statutory, mandatory and compliance guidance standards applicable to the construction and design proposals, as well as the statutory compliance standards that will apply when the building is occupied.
- 7.3 Guidance on the provision of automatic fire control systems, including sprinkler systems, is provided in SHTM 82: Supplement A: 'Automatic fire control systems and voice alarm systems'.
- 7.4 A fire suppression system should be designed only by a person/s competent to do so, in consultation with the appropriate regulatory authorities e.g. The Fire and Rescue Service and Building Control Dept and the local Fire Safety Advisor of the Health Board.
- 7.5 When consideration is being given as to whether or not a sprinkler or other fire suppression is required, consideration should be given not only to life safety issues, such as the viability of evacuation times, the degree of patient dependency and departmental relationships but must also consider the wider

strategic importance of the facility in regard to the provision of healthcare services e.g. a national treatment centre, a national distribution centre or similar facility, the loss of which would have a significant impact on the ability of NHSScotland to provide patient services over a wide area, or may affect the provision of key support services to a number of Boards.

Requirement

- 7.6 The provision of a fire suppression system must be considered for new and major refurbishment hospital proposals, taking into account the guidance provided in SHTM 82: 'Alarm and detection systems', Supplement A: Version 1 – 'Automatic fire control systems and voice alarm systems' and this document. The basis on which design decisions are made should be fully documented as a component of the fire strategy for the proposals.
- 7.7 Where installed, sprinkler systems should comply with the requirements of BS EN 12845.

8. Fire fighting provisions

Principle

- 8.1 The design and construction of the hospitals must ensure that there is suitable access for fire-fighting and adequate provision of facilities for fire fighting conforming to the requirements of the non-domestic technical handbook and the guidance in this section.

Portable fire fighting equipment

- 8.2 Portable fire fighting equipment should be provided and sited in accordance with the requirements of BS 5306 – 8.
- 8.3 Generally there should be two 13A rated extinguishers, for every 400m² or part thereof. Extinguishers using CO₂ or other media should be provided for electrical and other specific risks as necessary. Fire blankets should be provided in all cooking and pantry areas. Guidance on the tackling fires and the classes of fire is provided in SHTM 83: 'Fire safety in healthcare premises - General fire precautions'.

Requirements

- 8.4 Portable fire fighting equipment including fire blankets must be provided as necessary.
- 8.5 Portable extinguishers must comply with BS EN 3, 6 and 7 and BS 7863 and be inspected and maintained in accordance with BS 5306 - 3.
- 8.6 Where provided, hose reel installations should comply with the relevant provisions of BS 5306 – 1.

Appendix: Fire strategy and drawings

- A1 The following information should be provided to assist the responsible persons to operate, maintain and use the building in reasonable safety and to assist the eventual owner, occupier and/or employer to meet their statutory duty under the Fire (Scotland) Act 2005 as amended, and the Fire Safety (Scotland) Regulations 2006,
- A2 For clarity, this guidance is given in terms of simple and complex buildings; however, the level of detail required will vary from building to building and should be considered on a case-by-case basis.

Fire strategy – simple buildings

- A3 For most buildings, basic information on the location of fire protection measures may be all that is necessary. An as-built plan of the building should be provided showing:
- a. escape routes;
 - b. compartmentation and separation (that is, location of fire-separating elements including cavity barriers in walk-in spaces);
 - c. fire doors, self-closing fire doors and other doors equipped with relevant hardware (for example panic locks);
 - d. locations of fire and/or smoke detector heads, alarm call-points, detection/alarm control boxes, alarm sounders, fire safety signage, emergency lighting, fire extinguishers, dry or wet risers and other fire-fighting equipment, and location of hydrants outside the building;
 - e. any sprinkler system(s), including isolating valves and control equipment;
 - f. any smoke-control system(s) (or ventilation system with a smoke-control function), including mode of operation and control systems;
 - g. any high-risk areas (for example heating machinery);
 - h. specifications of any fire safety equipment provided, in particular any routine maintenance schedules;
 - i. any assumptions in the design of the fire safety arrangements regarding the management of the building;
 - j. facilities for the operational use of the Fire and Rescue Service.

Complex buildings

- A4 For more complex buildings, a more detailed record of the fire safety strategy and procedures for operating and maintaining any fire protection measures of the building will be necessary.

Further guidance is available in BS 9999:2008.

A5 These records should include:

- a. the fire safety strategy, including all assumptions in the design of the fire safety systems (such as fire load), and any risk assessments or risk analysis;
- b. all assumptions in the design of the fire safety arrangements regarding the management of the building;
- c. escape routes, escape strategy e.g. simultaneous or phased; and assembly areas;
- d. details of all passive fire safety measures, including compartmentation (that is, location of fire-separating elements) and hazard rooms, cavity barriers, self-closing fire doors and other doors equipped with relevant hardware (for example electronic security locks), duct dampers and fire shutters;
- e. heat, smoke and multi state detector heads, alarm call-points, detection/alarm control boxes, alarm sounders, emergency communication systems, CCTV, fire safety signage, emergency lighting, fire extinguishers, dry or wet risers and other fire-fighting equipment, other interior facilities for the fire-and-rescue service, emergency control rooms, location of hydrants outside the building, and other exterior facilities for the fire-and-rescue service;
- f. details of all active fire safety measures, including:
 - sprinkler system(s) design, including isolating valves and control equipment; and
 - smoke-control system/s (or HVAC system with a smoke-control function) design, including mode of operation and control systems;
- g. any high-risk areas e.g. heating machinery, and particular hazards such as highly flammables or medical gas cylinder stores;
- h. as-built plans of the building showing the locations of the above;
- i. specifications of any fire safety equipment provided, including operational details, operator manuals, software, system zoning, routine inspection, and testing and maintenance schedules. Records of any acceptance or commissioning tests;
- j. any other details appropriate for the specific building.

Fire drawings

A6 To adequately assess the fire precautions at the design stage, a set of fire drawings should be prepared using symbols based on BS 1635. In addition to hardcopy, electronic copies of drawings should be provided.

A7 The drawings should show in sufficient detail the means of escape, the structural fire precautions, the detection and alarm systems, the automatic smoke control system(s), the smoke control/ventilation arrangements, including

HVAC ductwork, the access and facilities for the fire and rescue service, the portable and fixed fire fighting equipment, in order to adequately assess compliance with the requirements of this guidance.

A8 A typical set of fire drawings would comprise:

- location plan;
- a site plan;
- a floor plan of each storey, prepared at a scale of not less than 1:200;
- a floor plan of each department, prepared at a scale of not less than 1:100 and preferably at a scale of 1:50;
- a set of elevations.

A9 During the construction of a project, variations to the structure, systems and the layout frequently occur. These variations should be agreed with the relevant enforcing authorities and should not subvert the integrity of the agreed fire precautions. The variations should be recorded on the fire plans so that on completion an 'as built' set of drawings can be prepared.

A10 The 'as built' drawings should be held on file so that any proposed future alterations can be checked against the fire drawings to ensure that the integrity of the fire safety strategy is maintained in accordance with the recommendations in this document.

A11 The following information, in addition to the fire drawings, should also be retained in the Health and Safety file;

- the fire safety strategy and evacuation management plan;
- records of compliance with the procurement procedures ([1.8 -1.11 refers](#));
- records of the testing and commissioning of all active fire precautions.

References

Acts and Regulations.

Building (Scotland) Regulations 2004

Fire policy for NHSScotland 2008; CEL 25 (2008)

Fire Safety (Scotland) Regulations 2006

Fire (Scotland) Act 2005 as amended

Scottish Building Standards; Procedural Handbook <http://www.sbsa.gov.uk/>

Scottish Building Standards; Non-domestic Technical Handbook
<http://www.sbsa.gov.uk/>

The Construction (Design and Management) Regulations 2007

The Management of Health and Safety at Work Regulations 1999

Disability Discrimination Act 1995

NHSScotland Firecode

Health Facilities Scotland website at <http://www.hfs.scot.nhs.uk/>

SHTM 81 Version 1 Part 2: Guidance on the fire engineering of healthcare premises, 2009

SHTM 82 Version 3: Alarm and detection systems, 2004

SHTM 83 Version 3: Fire safety in healthcare premises: General fire precautions, 2004

SHTM 85 Version 4: Fire precautions in existing hospitals, 2007

SHTM 86 Version 4 Part 1: Fire risk assessment in community healthcare premises, 2007

SHTM 86 Version 4 Part 2: Fire risk assessment in healthcare premises, 2007

SHTM 87 Version 4: Textiles and furniture, 2004

SFPN 3 Version 3: Escape bed lifts, 1999

SFPN 4 Version 3: Hospital main kitchens, 1999

SFPN 5 Version 3: Commercial Enterprises on Hospital Premises, 2004

SFPN 6 Version 3: The prevention and control of deliberate fire-raising in NHS healthcare premises, 2007

SFPN 7 Version 7: Fire precautions in patient hospitals, 2004

SFPN 10 Version 3: Laboratories on hospital premises, 1999

SFPN 11 V1: Reducing unwanted fire signals in healthcare premises, 2006

A Model Management Structure for Fire Safety, 1999

Scottish Health Technical Memoranda

Health Facilities Scotland website at <http://www.hfs.scot.nhs.uk/>

SHTM 2007: 2001: Electrical services – supply and distribution

SHTM 2009: 2001: Pneumatic air tube transport systems

SHTM 2011: 2001: Emergency electrical systems. Health Facilities Scotland

SHTM 2022: 2001: Medical gas pipeline systems. Health Facilities Scotland

SHTM 2025: 2001: Ventilation ductwork in healthcare premises

British Standards Institution

British Standards: British Standards Institution (<http://www.bsi-global.com/>). The following standards are those applicable at the time of publication.

BS 476: Part 22: 1987: Fire tests on building materials and structures; methods for determination of the fire resistance of non-loadbearing elements of construction

BS 1635: 1990: Recommendations for graphic symbols and abbreviations for fire protection drawings

BS 5266: Part 1: Emergency lighting; code of practice for the emergency lighting of premises

BS 5266: Part 7 / BS EN 1838: Lighting applications; emergency lighting

BS 5266 BS / EN 50172 Part 8: 2005: Emergency lighting

BS 5266 – 10: Guide to the design and provision of emergency lighting to reduce the risks from hazards in the event of failure of the normal lighting supply.

BS 5306: Part 1: 2006: Code of practice for fire extinguishing installations and equipment on premises. Hose reels and foam inlets.

BS 5306: Part 3; 2003: Code of practice for the inspection and maintenance of portable fire extinguishers

BS 5306: Part 8: 2000: Emergency escape lighting systems

BS 5839: Part 1: 2002: Fire detection alarm and control systems

BS 5839: Part 3: 1988: Fire detection and alarm systems for buildings; specification for automatic release mechanisms for certain fire protection equipment

BS 5839: Part 8: 1988: Code of practice for the design, installation and servicing of voice alarm systems

BS 5839: Part 9: 2003: Disabled refuge emergency voice communication (EVC)

BS 7036: 1996: Code of practice fire safety at powered doors for pedestrian use

BS 7273: Part 4: 2007: Code of Practice for the operation of fire protection measures. The actuation of release mechanisms for doors

BS 7863: 1996: Recommendations for Colour Coding to indicate the extinguishing media contained in portable fire extinguishers.

BS 8214: 1990: Code of practice for fire door assemblies with non-metallic leaves.

BS 9999: 2008: Fire safety in the design, management and use of buildings

BS EN 3: 2004: Portable fire extinguishers.

BS EN 3-6: Provisions for the attestation of conformity of portable fire extinguishers in accordance with EN3 Parts 1 to 5

BS EN 3-7: Portable fire extinguishers; characteristics, performance requirements and test methods

BS EN 54: Fire detection and alarm systems

BS EN 1154: 1997: Building hardware. Controlled door closing devices

BS EN 1634: Part 1: 2000 Fire resistance tests for door and shutter assemblies. Fire doors and shutters

BS EN 12845: 2004: Fixed fire-fighting systems, automatic sprinkler systems

Other guidance

CIBSE; Lighting guide LG2; Hospitals and healthcare buildings

Fire prevention on construction sites, 6th Edition; Joint code of practice by the Building Employers Federation – Loss Prevention Council – National Contractors Group; ISBN 9781902790336

Construction Information Sheet 51 (CIS 51); Construction Fire Safety; HSE

Standard fire precautions for contractors engaged on Crown works; Dept of the Environment; TSO; ISBN 0-11-75223-5