

NHSScotland 'Firecode'

**Scottish Health Technical
Memorandum 81
Version 3**

Fire precautions in new hospitals



**This document forms part of
NHSScotland Firecode Edition No 3**

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Disclaimer

The contents of this document are provided by way of guidance only. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application. No warranty is given as to the accuracy of the contents and the Property and Environment Forum Executive, which produced this document on behalf of NHSScotland Property and Environment Forum, will have no responsibility for any errors in or omissions therefrom.

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Guidance revised 1 April 2003.
All previous versions are superseded.



About this publication

This Scottish Health Technical Memorandum (SHTM) provides guidance on the design of fire precautions in new hospitals and major extensions/refurbishments to existing hospitals in Scotland. It supersedes the existing guidance contained in Version 2 published in December 1999.

SHTM 81 is a code of practice which recognises the special requirements of fire precautions in the design of new hospitals and major extensions/refurbishments of existing hospitals. It recognises the interaction between physical fire precautions, the dependency of the patient, the fire hazards within hospitals, management policies and procedures, and the availability of adequately trained staff in achieving an acceptable level of fire safety.

This version of SHTM 81 was prepared for NHSScotland Property and Environment Forum by Glasgow Caledonian University under the auspices of a national and multi-agency working group and following wide scale consultation with NHSScotland.

REVISIONS

This Version aligns SHTM 81 with the 6th Amendment of the Technical Standards to the Building Standards (Scotland) Regulations, hereafter referred to as the 'Technical Standards'.

The term 'Trust' used herein means an NHSScotland Trust, Island Health Board and NHS Property Holding Bodies. In due course the term Health Board may replace Trust eg NHS Borders.



1. Introduction and scope

General application

- 1.1 This Scottish Health Technical Memorandum (SHTM) provides recommendations and guidance which is additional to the Statutory Requirements of the Building Standards (Scotland) Regulations 1990, as amended. It does so to address the special requirements of fire safety in patient care areas of hospitals and must be read in conjunction with the Technical Standards.
- 1.2 While the incidence of fire in hospitals is low compared to that in other buildings, the consequences of a fire in hospitals can be especially serious because of the difficulties and dangers associated with the emergency evacuation of patients, many of whom may be highly dependent on life support equipment and staff assistance etc.
- 1.3 The management procedures and technical aspects described in this document should be incorporated into the procurement and design of new hospitals and major extensions/refurbishments to ensure adequate provision for fire containment and extinguishing, and means of escape for patients/visitors, staff and contractors. It is the responsibility of the Trust 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.
- 1.4 '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 any existing hospitals which are used as means of escape from any extension to a hospital.

Guidance on fire safety in existing hospitals is available in SHTM 85 'Fire precautions in existing hospitals' and SHTM 86 'Fire risk assessment in existing hospitals'.

- 1.5 The guidance in this document applies to all work requiring a building warrant. It is left to the judgement of the professional Project Team (internally or externally appointed) advising the Trust Chief Executive to determine, following consultation, whether the guidance in this document is appropriate to projects that do not require a building warrant. If it is concluded that the guidance in this document is not appropriate to a particular project, the basis for the decision



should be fully documented and the decision confirmed by the Trust Chief Executive. In connection with this, attention is drawn to the procedures set out in [paragraph 1.7](#) below.

It is recommended that the Trust Chief Executive also consults with their local Trust Fire Safety Advisor and the Property and Facilities Management Team.

Relationship with Technical Standards - Procurement Procedures

- 1.6 The guidance in this document relates only to hospitals defined in the Technical Standards as purpose sub-group 2A. The term 'hospitals' covers a broad spectrum of premises used to treat NHSScotland patients. The Technical Standards specify the minimum requirements for the provision of structural fire protection, means of escape and fire fighting facilities. This document specifies additional requirements for effective fire safety and operational management within hospitals.

The requirements of the Technical Standards must be achieved, with 'relaxations' formally agreed, as necessary. SHTM 81 should also be met, with 'waivers' formally agreed, as necessary. The procedures for approval of relaxations to be granted in relation to the Technical Standards by the regulatory authority are well established and statutory; the procedures for approval of 'waivers' from SHTM 81 are introduced in this version of SHTM 81 for the first time as set out in [paragraphs 1.7, 1.8 and 1.9](#) below.

- 1.7 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 which should be followed to satisfy the statutory requirements of the Buildings Standards (Scotland) Regulations.

- a) All new or refurbishment projects for hospitals start with the appointment of an appropriate Design Team, Service Provider, Private Finance Initiative Provider, Public Private Finance Partner etc. in accordance with the Scottish Capital Investment Manual, HDL (2001) 47 or NHSScotland Procure depending on project value.

During the appointment process the Trust Chief Executive should ensure that all prospective suppliers or providers of the hospitals for NHSScotland patients will be supplied with a current version of NHSScotland 'Firecode' and receive written confirmation of receipt of this from all parties involved;

- b) The Trust Chief Executive should ensure that the Project Brief, performance specifications, design standards etc. produced by the Trust for the hospitals being built, extended or refurbished will contractually include the guidance set out in NHSScotland 'Firecode', and SHTM 81 in particular, if it is agreed that it is applicable. SHTM 81 will be the minimum standard to be achieved unless 'relaxations' or 'waivers' have been agreed as described below.



The prospective Design Team, Service Provider etc., should be informed of the above requirements/procedures during the briefing/tendering stage. An early undertaking by all Providers in this respect is essential and the 'plan of work' for the design of the new premises should incorporate the procedures and requirements in SHTM 81 of the Firecode suite of documents 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, taking into account the Technical Standards and the Firecode suite of documents. The Trust Chief Executive will thereafter appoint an in-house or independent third party body to assess whether or not the standards specified in Firecode, including SHTM 81, have been achieved. There will be a formal 'signing off' process by the Trust 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, as this creates a conflict of interest and an additional cost for the client. There should be no discussion between the in-house or independent third party body and the design team as robustness requires that documentation should in itself be complete and provide all information required. However, in order to inform the design process, the in-house or independent third party body should clearly describe the grounds for deciding that a design proposal does not meet the required standard.

- 1.8 If considered necessary by the Trust Chief Executive, the in-house or independent third party body may consult the NHSScotland Property and Environment Forum Executive Fire Group for advice on any aspect of Firecode, including 'waivers' to Firecode. The Fire Group will formally advise the Trust Chief Executive, thereafter the Trust Chief Executive will instruct the design team or Service Provider accordingly under the terms of the procurement contracts in place.
- 1.9 Once this process is complete the design and specifications may be submitted for Building Control approval, including a formal written summary of the above process. Throughout the process described above, through to the final design, the Trust Chief Executive will be mindful of the need for statutory fire safety risk assessments as part of the Fire Precautions (Workplace) Regulations 1997 (as amended). On occupation of the hospital these Regulations will apply.

Scope of SHTM 81

- 1.10 The main purpose of this document is to provide guidance on the standards of fire safety required in new hospitals, see [paragraph 1.11](#).



- **Section 3** provides recommendations on designing for progressive horizontal evacuation, and planning relationships to minimise the possibility of fires in non-patient access areas which affect patient access areas;
- **Section 4** provides recommendations on detection and alarm systems which should be provided in hospitals;
- **Section 5** provides recommendations on means of escape provisions;
- **Section 6** provides recommendations on structural fire precautions for the containment of fire and smoke.

The range of NHSScotland premises providing patient care facilities is extensive, and the guidance in this document may not be appropriate for all types of building. However, it is expected that NHSScotland Services and Premises Providers, designers, Building Control and Fire Authorities, will exercise a degree of judgement based on a full understanding of the circumstances, taking into account the factors listed below and the requirement to ensure high levels of fire safety provision. Relevant factors include:

- the dependency of the patient;
- fire hazards within the premises;
- management policies;
- availability of sufficient and adequately trained staff;
- statutes and mandates (SEHD Fire Policy).

- 1.11 When using this document, it is important to recognise that it is not possible to make comprehensive recommendations covering all eventualities and it should always be borne in mind that the purpose of hospitals is to provide medical treatment, and/or nursing care. The complex nature of hospitals will sometimes require a more flexible approach to ensure that the correct balance is achieved between fire safety and the requirements for treatment and nursing care. This should be done on the basis of professional judgement and an understanding of the nature of the problems; however, care should be taken to avoid compromising the safety of patients, visitors, employees and contractors.
- 1.12 In the design of hospitals reliance should not be placed on external rescue by the Fire Brigade or manipulative types of escape appliance such as chutes or portable ladders. Mattress evacuation is also not a first option but evacuation routes should allow for such. This document has been prepared on the basis that in an emergency the occupants of any part of a healthcare premise should be able to move, or be moved, to a place of relative safety with assistance in the first instance, from staff only. As a fire situation develops, it may be necessary for the Fire Brigade to assist in patient evacuation.
- 1.13 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 a similar standard by adopting a fire safety engineering approach. A fire safety engineering approach that takes into account the total fire safety



package can provide an alternative approach to fire safety, provided approval is obtained from the Trust Chief Executive as set out in the procedures in [paragraph 1.7](#). If an alternative approach is used, the responsibility is placed upon the designer to demonstrate that the proposed design provides an equivalent or higher level of fire safety to that of 'Firecode'.

1.14 Any new building which does not provide departments or areas to which patients have access and which 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;

should be designed in accordance with the Technical Standards, together with other appropriate guidance.

Use by competent persons

1.15 This document should be used by competent persons employed as:

- Property/Estates/Building/Engineering Officers, Facilities Managers and Health/Fire Safety staff employed by a NHSScotland Trust;
- Architectural, Building and Engineering consultants;
- Local Authority Building Control Officers;
- Fire Safety consultants;
- Fire Officers of the Local Fire Authority.

Persons will be considered competent where they have sufficient technical knowledge, training and experience both to understand fully the requirements of fire safety procedures and management involved, and to undertake properly the measures referred to in this document.

Consultation

1.16 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 early consultation takes place between the Design Team, the Trust Fire Safety Advisor and all 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.

1.17 It is not possible to provide absolute safety from fire and smoke. The guidance in this document should reduce, so far as it is reasonably practicable, the



probability of exposing patients, visitors, staff and contractors etc. to hazardous conditions.

Fire safety during building operations

- 1.18 A significant number of fires occur as a result of construction activity. The site activities of contractors should be adequately supervised and controlled. The Trust should ensure that adequate precautions against fire are in place and the Trust Fire Safety Advisor maintains regular contact with contractors to ensure that the local fire safety policy is being complied with.
- 1.19 Guidance on fire safety on construction sites is provided in:
- '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 (ISBN 0-902167-17-0);
 - 'Standard fire precautions for contractors engaged on Crown works' published by the Department of the Environment, HMSO (ISBN 0-11-75223-5);
 - The Construction (Health and Safety and Welfare) Regulations 1996;
 - 'Designing for Health and Safety in construction' published by the Health and Safety Executive, HMSO (ISBN 0-7176-0807-7).

Other NHSScotland Firecode guidance

- 1.20 The guidance in this document has been prepared on the understanding that the hospitals (see [paragraph 1.4](#)), when completed, will be managed in accordance with the guidance in SHTM 83 'Fire safety in healthcare premises – General fire precautions'. The contents of the hospitals should, as far as reasonably practicable, comply with guidance in SHTM 87 'Textiles and furniture'.
- 1.21 This document should also be read in conjunction with the guidance contained in the latest versions of the following NHSScotland Firecode documents:
- | | |
|---------------------------------|--|
| SHTM 82, Version 2 | Alarm and detection systems; |
| SHTM 82, Supplement A Version 1 | Automatic fire control systems and voice alarm systems; |
| SHTM 83, Version 2 | Fire safety in healthcare premises – General fire precautions; |
| SHTM 84, Version 3 | Fire safety in residential care premises; |
| SHTM 85, Version 3 | Fire precautions in existing hospitals; |
| SHTM 86, Version 3 | Fire risk assessment in existing hospitals; |



SHTM 87, Version 2	Textiles and furniture;
SFPN 3, Version 2	Escape bed lifts;
SFPN 4, Version 2	Hospital main kitchens;
SFPN 5, Version 2	Commercial enterprises on hospital premises;
SFPN 6, Version 2	Arson prevention and control in NHS healthcare premises;
SFPN 7, Version 2	Fire precautions in patient hotels;
SFPN 10, Version 2	Laboratories on hospital premises.

Other legislation

1.22 Other relevant legislation includes:

- Fire Precautions (Workplace) Regulations 1997 (as amended);
- The Construction (Design and Management) Regulations 1994 (amended 2000);
- 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 Part A of the Technical Standards to the Building Standards (Scotland) Regulations will be used. The Standards specified for hospitals in the Technical Standards apply to all hospitals where there is patient access. The following additional definitions also apply:

- **circulation space:** the communication routes both within the department/management unit giving access to other parts of the 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 Brigade 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;
- **ignition sources:** heat sources or flames which may cause ignition;
- **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;
- **Technical Standard(s):** refers to the 6th Amendment of the Technical Standards to the Building Standards (Scotland) Regulations 1990;
- **SHTM/SFPN:** refers to the versions of these documents contained in Firecode Edition 3.

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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 with restricted mobility, patients who use wheelchairs, and bedbound patients cannot negotiate escape routes, particularly stairways, unaided. Patients under medication may require staff assistance, and patients who are dependent on electrical/mechanical equipment for their survival cannot always be disconnected and moved rapidly without serious consequences.
- 3.2 This document has been prepared on the assumption that there are sufficient and adequately trained staff on duty in a hospital to provide assistance with any necessary evacuation in the event of fire. However, despite this, the evacuation of an entire hospital in the event of fire would be an enormous exercise in which patients might be placed at risk due to trauma or their medical condition. Should evacuation become necessary it will be based on the concept of progressive horizontal evacuation with only those people directly at risk from the effects of fire and/or smoke being moved. It is the responsibility of the Chief Executive to ensure that an appropriate fire safety policy and management system is in place which:
- integrates static and dynamic fire safety provisions, housekeeping and evacuation plans;
 - is supported by adequate staff numbers;
 - is supported by adequate training;
 - is audited by an appropriate fire risk assessment.

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. The 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 evacuation lift. 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, and to minimise Fire Brigade response time, an automatic detection and alarm system must be incorporated into the building.

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. In certain hospitals where patients are able to escape without assistance, alternative escape strategies may be acceptable.
- 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 from the non-patient access areas affecting the patient access areas.
- 3.8 In this document, and in the Technical Standards, 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 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, special care baby units, and operating departments.
- 3.10 The hazard presented by non-patient access areas is categorised as follows:
- **high hazard departments:** departments/management units which 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. 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. The minimum provisions described in Technical



Standard D5 are required for any area in the building that presents a comparable hazard to the areas listed in the Technical Standard;

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

Requirements

- 3.11 The relative location of non-patient access areas 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 Technical Standard D5 'Separating walls and separating floors'.
- 3.12 Main medical gas stores must comply with SHTM 2022: 'Medical gas pipeline systems'.
- 3.13 The Technical Standards have additional requirements for 'Places of Special Fire Risk'.
- 3.14 In addition to the requirements in the Technical Standards for fire safety precautions in commercial enterprises and atria in hospitals, further guidance is provided in:
- SFPN 5: 'Commercial enterprises on hospital premises';
- BS 5588: Part 7 (to be superseded by BS 9999: Part 2);
- BRE and CIBSE design guides for smoke control systems.

Staffing levels

- 3.16 The provision of an adequate number of staff who have received effective fire safety training is the best first-line 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.
- 3.17 The guidance in this document has been prepared on the understanding that adequate numbers of staff will be available at all material times. The number of staff that are required to be available is in part a function of the hospital design. It is the responsibility of management to devise suitable arrangements to provide for the safe evacuation of patients in accordance with the emergency evacuation plan and fire risk assessment. Guidance on the preparation of emergency plans is provided in SHTM 83: 'Fire safety in healthcare premises - General fire precautions'.



Requirement

- 3.18 When the department/management unit is in use, there must be sufficient staff available at all times. These staff must have received training in the methods of patient evacuation appropriate to the dependency of the patients and be familiar with the evacuation procedures at their place of work, HDL (2001) 20 refers.

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4. Communications

Principle

- 4.1 The design and construction of the building should ensure that fires are detected at the earliest possible opportunity and that suitable warning is then given to the occupants and the emergency services. It may be appropriate to have separate provisions for warning staff, patients and visitors. The operation of the warning system should be clearly documented in the fire safety strategy and evacuation management plan.
- 4.2 The provision of adequate means for detecting a fire and raising the alarm is of vital importance. Detection is dependent on staff observation and the automatic detection and alarm systems. Early detection permits time for orderly evacuation and allows the fire to be tackled at an early stage thus minimising the damage caused.

Observation

- 4.3 The early detection of fire by people is probably the best form of detection, and the design and layout of an area can make a positive contribution to fire safety. Within a patient access area the most important aspect is the number of beds visible from the staff base, which is the base from which all staff work and where information is stored and exchanged. Although it is unlikely that the staff base will be permanently staffed, a location that provides good observation will improve the likelihood of a fire being detected at an early stage.

Detection and alarm systems

- 4.4 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: 1988 'Fire detection and alarm systems for buildings: Code of practice for system design, installation and servicing' and the criteria specified in the Technical Standard E11.2, and [paragraph 4.5](#).
- 4.5 Notwithstanding the exception in the 'Deemed to Satisfy Provisions to Technical Standard E11.2', all voids containing pipes carrying medical gases, as defined in SHTM 2022: 'Medical Gas Pipeline Systems', or natural gas, require automatic detection.



- 4.6 The selection and siting of detectors should take into account the operational requirements of the area and the risk and impact of false alarms. In this context consideration should be given to alternatives to standard smoke and heat detectors such as multi-sensor detectors with or without gas leakage sensors as appropriate.
- 4.7 Voice alarm systems 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 given in SHTM 82 and BS 5588: Part 8.

Requirements

- 4.8 The detection and alarm systems must comply with the guidance in SHTM 82: 'Alarm and detection systems' and the criteria specified in:

- Technical Standard E11.2;
- [Section 4 Paragraph 4.5](#).

Note: Cognisance should be taken of the potential sensory impairment of occupants including patients, visitors and staff etc.



5. Means of escape

Principle

- 5.1 The design and construction of hospitals should ensure that, at all times, patients, visitors, staff and contractors can 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.
- 5.2 The means of escape in hospitals must comply with the requirements of the Technical Standards 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 distances and escape routes;
 - the provision of an adequate number of escape stairs;
 - emergency lighting and escape lighting.

Requirement

- 5.3 The provisions for means of escape in hospitals must comply with the requirements of the Technical Standards, with particular reference to Parts D and E.

Compartmentation

- 5.4 The provision of compartments and sub-compartments to facilitate progressive horizontal evacuation should not be seen only in terms of means of escape. The user responsibilities, such as the extent of the area under their control, including the day-to-day management, fire drills, the management of evacuation, etc., will have a significant impact on the design, integrity, size and configuration of compartments and sub-compartments.



Requirement

Hospitals with a topmost storey height of not more than 7.5m above ground level.

- 5.5 All storeys, which contain patient access areas in hospitals with a topmost storey height of less than 7.5m must be divided into a minimum of two compartments. Where a storey is divided into only two compartments and a compartment provides sleeping accommodation, the number of beds for patients in the compartment must be no more than 20.

Hospitals with a topmost storey height greater than 7.5m above ground level.

- 5.6 Where a sub-compartment provides sleeping accommodation the number of beds for patients in the sub-compartment must not be more than 20.

Travel distance

- 5.7 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.

Requirement

- 5.8 Where the escape route from a room into an unprotected zone passes a waiting area or sub-waiting area the escape route must be safeguarded by a fixed screen or similar item of furniture.

Hospital streets

- 5.9 In the design of hospitals, the concept of the hospital street as the main communication route is widely used. The hospital street provides an essential link between hospital departments, escape stairs and escape bed lifts; it is also the main circulation route for staff, patients and visitors. Although many hospitals will be provided with hospital streets, they are not an essential requirement.

- 5.10 A hospital street is a special type of protected zone which connects places of safety, escape stairs, escape bed lifts, fire-fighting shafts and compartment entrances. It has two key functions from a fire safety perspective:

- it will serve the Fire Brigade as a fire-fighting bridgehead;
- if the spread of fire within a compartment cannot be brought under control, the occupants of the compartment affected may be evacuated via the hospital street to parts of the hospital not affected by the fire.



Vertical escape

5.11 The minimum provisions for vertical escape are prescribed in the Technical Standards. However, mattress evacuation is inherently hazardous and should not be considered to be the normal accepted course of action in an emergency. Therefore where vertical escape is a possibility and bed lifts are installed in the building these 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;
- the escape bed lifts must comply with the design considerations of SHTM 2024 'Lifts'
- the escape bed lifts must comply with the general technical guidance provided in SFPN3 'Escape bed lifts'.
- the managerial and organisational arrangements specified in SFPN3 'Escape bed lifts' must be implemented.

Requirement

5.12 External stairways must not be provided for escape purposes to those parts of the building to which patients have access.

Protected lobbies

5.13 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.

Requirement

5.14 Access from car parks to hospitals must be through a protected lobby.

Final exits

5.15 Generally within hospitals many of the final exits will also be used as everyday access to the hospitals and consequently will be designed to permit access for people with restricted mobility. However, there will be some exits provided only for escape purposes, these will also be designed to take cognisance of the Disability Discrimination Act (1995).

5.16 The design of all exits should recognise the often conflicting requirements of means of escape and security of the hospital. It is not possible to provide definitive guidance, however any solution should be agreed between the enforcing authorities, the Trust management and its security advisors.



Requirement

- 5.18 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 1 metre. 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

- 5.19 Should it become necessary to evacuate an entire hospital or part of a hospital, adequate external assembly positions should be available. Suitable positions may be roadways, hard standings or suitably designed parts of the landscaping not forming part of a designated fire appliance access route. The evacuation management plan should provide for subsequent movement of patients to suitable temporary accommodation.

Requirement

- 5.20 The following points must be considered when designing external routes and assembly;

- the location of assembly positions to permit access for ambulances without compromising Fire Brigade 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.

Emergency and escape lighting

- 5.21 For hospitals, the general guidance on emergency lighting contained within BS5266: Part 1: 1999 is supplemented by SHTM 2007 'Electrical Services – supply and distribution', SHTM 2011 'Emergency electrical services' and the CIBSE guide 'Lighting guide for hospitals and health buildings' which provides additional guidance on hospital emergency lighting and details of the electrical supply required.
- 5.22 The Technical Standards impose minimum requirements for emergency lighting in buildings.



Background

- 5.23 Irrespective of the requirements for fire safety within hospitals there is an operational requirement to provide emergency lighting. The SHTMs and CIBSE guide mentioned above provide considerable guidance on the design of emergency electrical services for hospitals. The guidance in this document has been prepared on the understanding that generally, in most of the departments of a hospital, the emergency lighting systems will also provide escape lighting of an adequate standard.
- 5.24 To enable essential hospital services to be maintained, most hospitals are provided with standby generators which 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 a 15 second 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.
- 5.25 Electrical distribution within hospitals is generally provided by essential and non-essential electrical circuits. These are normally segregated; however where this is not possible, essential services cables are wired in fire-resistant cable.
- 5.26 Consequently, within hospitals, emergency lighting is provided by separately wired and controlled essential and non-essential electrical circuits. 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.
- 5.27 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 lighting.



Requirements

- 5.28 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'.
- 5.29 Any part of an escape route from a door to a room should have at least one lighting circuit supplied from the essential circuit system.
- 5.30 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.
- 5.31 The distribution boards for the essential and non-essential circuits may be in the same location but should be in separate metal cabinets.
- 5.32 In those areas where a 15 second 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.
- 5.33 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 Part 1: 1988 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.

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 and maintain its structural stability to 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.

Requirement

- 6.2 The provisions for the containment of fire and smoke in hospitals must comply with the requirements of the Technical Standards with particular reference to Parts D and E.

Additional Requirements

Fire resistance

- 6.3 Suspended tiled ceilings should not be included in the determination of the level of fire safety performance of a floor.

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

- 6.3 Intensive treatment areas must be divided into two sub-compartments, to separate the 'nursing area' from the 'utility area'.

Transfer grilles

- 6.4 To reduce the possibility of smoke transfer between compartments and sub-compartments, the installation of transfer grilles in fire resisting doorsets in compartment and sub-compartment walls should be avoided. Where, however, they are essential as part of the designed air transfer system they must be provided with remotely resettable fire and smoke shutters operated by the detection and alarm system.



Ventilation ductwork

- 6.5 Ventilation ductwork must comply with BS 5588: Part 9 and SHTM 2025: 'Ventilation in healthcare premises'.
- 6.6 Ductwork passing through a compartment boundary must be provided with remotely resettable fire and smoke dampers operated by smoke detection.
- 6.7 Ductwork passing through a sub-compartment wall must be provided with remotely resettable fire and smoke dampers operated by smoke detection unless the duct complies with the requirements of the 'Deemed to Satisfy' provision of Technical Standard D4.7.
- 6.8 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 maintains the minimum level of fire safety performance of the cavity barrier.
- 6.9 Pneumatic air tube transport systems must comply with the requirements of SHTM 2009: 'Pneumatic air tube transport systems'.

Fire doors

- 6.10 With the exception of fire doors which are kept locked shut, fire doors must be fitted with an automatic self-closing device.
- 6.11 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 management this is impracticable, it should be the specific responsibility of a competent 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.
- 6.13 All fire doors, including each leaf of double doors, must be provided with an identification disc. The disc must be a minimum of 45 mm in diameter clearly indicating the level of fire safety performance of the door.
- 6.14 Sliding doors are acceptable on escape routes provided that they comply with the requirements of the Technical Standards.
- 6.15 Door swings must not obstruct the circulation space or escape route designed width. 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.

- 6.16 Fire doors across escape routes providing alternative means of escape must be double swing and be 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.
- 6.17 Fire doors across circulation routes must be fitted with glazed observation panels to assist wheelchair users.
- 6.18 Additional guidance on the specification of doors and doorsets is available in HTM 58 'Doorsets'.

External vertical fire spread

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

Requirement

- 6.20 A fire engineering analysis is required to demonstrate that the design and construction of the external envelope adequately protects against the risk of external vertical fire spread.

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

Design of HVAC systems

- 6.21 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 of 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'.
- 6.22 In the event of a fire, large quantities of smoke and toxic gases can 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 a fire from entering or leaving ductwork;
 - limit the spread of fire, 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 penetrated by ductwork.

Requirements

- 6.23 Ventilation systems must be designed and installed to comply with SHTM 2025: 'Ventilation in healthcare premises' and BS 5588: Part 9 1999 'Code of practice for ventilation and air conditioning ductwork', and the paragraphs below.
- 6.24 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

- 6.25 The ventilation plant should not be automatically shut down on the operation of the automatic fire detection and alarm system. In the event of a fire emergency the system should operate to inhibit the spread of smoke and be provided with the facility for shut-down and start-up under the instruction of the Fire Brigade. Fire Brigade control should be 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.

- 6.26 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.
- 6.27 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

- 6.28 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 Brigade and must be controlled 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 The design of an appropriate fire control system, including a water sprinkler system, requires evaluation of the interaction of many factors including occupant density and characteristics, spatial organisation and fire load density and distribution. The system should be designed by a competent person in consultation with the regulatory authorities and the Trust's Fire Safety Advisor.
- 7.2 Guidance on the provision of sprinkler systems in hospitals is given in SHTM 82: 'Alarm and detection systems'.

Requirement

- 7.3 Sprinkler systems, where installed in hospitals must be classified to comply with the requirements of SHTM 82 'Alarm and detection systems', Supplement A: Version 1 – 'Automatic fire control systems and voice alarm systems'.



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 in compliance with the requirements of the Technical Standards and the guidance in this section.

First aid/fire fighting equipment

- 8.2 Generally there should be two water extinguishers, of 9-litre capacity or the equivalent, for every 400 m² or part thereof. Extinguishers using CO₂ or other media should be provided as required. Fire blankets should be provided in all cooking and pantry areas. Guidance on the means of extinguishing various classes of fire is provided in SHTM 83 'Fire safety in healthcare premises - General fire precautions'.

Requirements

- 8.3 Hand-held extinguishers and fire blankets must be provided as necessary.
- 8.4 Portable extinguishers must comply with BSEN 3 and BS 7863 and be inspected and maintained in accordance with BS 5306: Part 3.

Appendix A – Record documents

- A1 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, digital copies of drawings should be provided.
- A2 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 facilities for fire-fighting and the portable and fixed fire fighting equipment in order to adequately assess compliance with the requirements of this guidance.
- A3 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.

Notes: These should be included in the Health and Safety File

- A4 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.
- A5 The 'as built' drawings should be held by the Trust 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.
- A6 In addition to drawings the following should be retained:
- the fire safety strategy and evacuation management plan;
 - records of compliance with the procurement procedures (1.6-1.8 refers);
 - records of the testing and commissioning of all active fire precautions.